

CANADA

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REPORT

OF THE

MINISTER OF PUBLIC WORKS

ON THE

WORKS UNDER HIS CONTROL

FOR THE FISCAL YEAR ENDED JUNE 30

1903

SUBMITTED IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 36  
SECTION 37, OF THE REVISED STATUTES OF CANADA

*PRINTED BY ORDER OF PARLIAMENT*



OTTAWA

PRINTED BY S. E. DAWSON, PRINTER TO THE KING'S MOST  
EXCELLENT MAJESTY

1904



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SECTION 27 OF THE REVISED STATUTES OF CANADA

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OTTAWA

1904

[No. 10, 1904]



*To His Excellency the Right Honourable Sir Gilbert John Elliot, Earl of Minto,  
G.C.M.G., &c., &c., &c., Governor General of Canada.*

MY LORD,

I have the honour to lay before your Excellency the Report of the Department of Public Works of Canada, for the fiscal year ended June 30, 1903.

I have the honour to be,

My Lord,

Your Excellency's most obedient servant,

JAMES SUTHERLAND,

*Minister of Public Works.*

OTTAWA, March 2, 1904.







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Thornbury, Ont. ....		17		139			
Thres Fathom Harbour, N.S. ....		11		58			
Three Rivers, P.Q., harbour .....		16		122, 193			
" public building .....		5, 23	11				
Tidnish, N.S. ....		11		59			
Tignish, P.E.I. ....		12		74			
Tiverton, N.S. ....		11		59			
Tobique River, N.B. ....		13		94			
Toronto, Ont., harbour .....		17		139			
" public buildings .....		7, 25	20				
Total expenditure of department .....		21					
Tracadie, N.B., lazaretto .....		4, 22					
Tracadie East, N.S. ....		12		59			
Transportation .....	8						
Trent and Newcastle, slides .....		18		226		5	
Trenton, Ont., dredging .....		17					
" public building .....		7, 25					
Truro, N.S., " .....		3, 22					
Tusket Wedge, N.S. ....		12		60			
Tyran, ss. cable ship .....		20			12		
<b>U</b>							
Uncollected slide and boom dues .....						8	
Upper Salmon River, N.B. ....		13		98			



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Names of Places, &c.	Part 1. Page.	Part 2. Page.	Part 3. Page.	Part 4. Page.	Part 5. Page.	Part 6. Page.	Part 7. Page.
<b>V</b>							
Vaillancourt, F., gratuity .....		21					
Valleyfield, P.Q., dredging .....		16		193			
" public building .....		5, 23					
Vancouver, B.C. " .....		8, 27	26				
Vancouver Salt Springs, telegraph .....		20			12		
Victoria, B.C., harbour .....		18		145, 212			
" public buildings .....		8, 27	26				
Victoria, Cape Beale, telegraph .....		20			11, 31		
Victoria, P.E.I. ....		12		74			
Victoria, Ont. ....		17		139			
Victoria, N.S. ....		12		60			
Victoria National Museum .....	10						
Victoriaville, P.Q., public building .....		5, 23					
<b>W</b>							
Walkerton, Ont., public building .....		7, 25					
Washabuck, N.S. ....		12		61			
Water, public buildings ..		22					
Wedge Point, N.S. ....		12		61			
Wendover, Ont., harbour ..		17		140			
West Baccaro, N.S. ....		12		61			
West Bay, Richmond, N.S. ....		12		61			
West Farnham, P.Q., public building .....		5, 23					
Western Head, N.S. ....		12		62			
Wetaskinwin, N.W.T., public building .....		26					
Whitehaven, N.S. ....		12		62			
White Mud River, Man .....		17		209			
Whitewater, N.S. ....		12		63			
Whycocomagh, N.S. ....		13		63			
Warton, Ont. ....		17		141			
Williams Head, B.C., quarantine .....		8, 27	26				
" wharf .....		18		145			
Wilson's Beach, N.B. ....		13		99			
Windsor, N.S., public building ..		3, 22					
Windsor, Ont. " .....		7, 25					
Winnipeg, Man., public buildings .....		7, 25	21				
Wireless telegraph .....					10		
Wolfe Island, Ont. ....			197				
Wolseley, N.W.T., court house .....		8, 26					
Wood Island, P.E.I. ....		12		74			
Woodstyck, N.B., public building .....		4, 22					
Woodstock, Ont. " .....		7, 25					
<b>Y</b>							
Yamaska River, P.Q. ....		16					
" lock .....		16		218		6	
Yarmouth, N.S., dredging .....		12		64			
" public building .....		3					
York Bridge, Ont. ....		19					
Yorkton, N.W.T., public buildings .....		8, 26	24				
Yukon River, Y.T. ....		18					
Yukon, public buildings .....		8	27	145			
" rivers, &c. ....		18		145			
" roads and bridges .....		19					
" telegraphs .....	10	20			12, 34		







PART 1

REPORT

OF THE

DEPUTY MINISTER OF PUBLIC WORKS

FOR THE YEAR ENDED JUNE 30

1903







REPORT  
OF THE  
DEPUTY MINISTER OF PUBLIC WORKS  
FOR THE FISCAL YEAR 1902-03

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DÉPARTMENT OF PUBLIC WORKS,

OTTAWA, March 3, 1904.

The Honourable JAMES SUTHERLAND,  
Minister of Public Works,  
Ottawa.

SIR,—I have the honour to submit to you the report of the Department of Public Works of Canada for the fiscal year ended on June 30, 1903.

It contains, as usual, an extended review of all the works executed during that fiscal year, with, in addition, the annual financial statement of the Accountant; a report by the Collector of revenue of the moneys received, as well as other statements referring to matters controlled by the department, &c., &c., which I trust will be read with interest.

The expenditure in all branches during the year 1902-3 has amounted to the total sum of \$5,830,518.11, divided as follows :—

Harbour and river works . . . . .	\$2,375,536 70
Dredging and plant . . . . .	982,391 15
Slides and booms . . . . .	135,624 62
Bridges and roads . . . . .	46,245 28
Public buildings . . . . .	1,539,005 60
Telegraphs . . . . .	559,092 58
Miscellaneous . . . . .	192,622 18
Total . . . . .	\$5,830,518 11

If to the above is added the sum of \$900,000, advanced to the Montreal Harbour Commission during the year, the aggregate sum expended under the supervision of the department, will form a grand total of \$6,730,518.11.



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It may be interesting to note here, by way of comparison, and to show the steady and rapid growth of the department since it was established, that in 1880 the total of the expenditure amounted to the sum of \$1,162,869.56; that in 1890 this sum had been increased to \$5,469,497.73, and for the year 1902-3 it amounted to the above named total of \$6,730,518.11, while the vote placed at the disposal of the Department of Public Works for the year 1903-4 is shown by the Supply Act to amount to a total of \$8,681,227.20.

REVENUE.

The revenue collected by the department during the year under review shows a total of \$276,063.53, an increase over the preceding year of \$45,893.97, the details of the revenue in question being as follows:—

Slides and booms.. . . . .	\$ 77,522 98
Docks and locks . . . . .	46,515 14
Telegraphs . . . . .	132,422 17
Miscellaneous . . . . .	19,603 24

The increase in revenue under the heading of slides and booms, for the year under review is, therefore . . . . .	\$20,187 03
For docks and locks.. . . . .	8,620 51
And for telegraphs.. . . . .	18,185 30

Here again, I may revert to the conditions which existed in 1889, when the collection of revenue was transferred to this department, from the Department of Inland Revenue, and when such collections amounted to the sum of \$14,811.86. This progression in the revenue indicates a remarkable advance in the money-producing works constructed by this department for the last twenty years, while the increase in the sums expended by the department shows that the provision made out of the public exchequer keeps pace with the rapid development of the country, and the ever increasing need of additional facilities for its trade and commerce.

HARBOUR AND RIVER WORKS.

In no part of the expenditure made by the Department of Public Works, is the care of the interests of the general trade of the country more patent to the casual observer, than in the large amount applied yearly to the improvement of the harbours and navigable channels of Canadian waters. Adding together the expenditure on harbour works, dredging, and that on slides and booms, we find a total for the last financial year of nearly \$3,493,552.47, to which may be added \$900,000 advanced to the Montreal Harbour Commission, or nearly four millions and a half for that branch of the public service.

This expenditure not only covers the large and important improvements made in the channel between Montreal and Quebec and at important harbours in the Dominion, but also a number of minor works destined to encourage and foster local trade at points where there is no railway communication, or where new industries have devel-



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oped which rely on the easier outlets provided by water transportation for the disposal of products due to the opening up of heretofore closed sections of our country.

In the province of Nova Scotia, for instance, improvements and dredging were performed at 133 places; in Prince Edward Island, 36; in New Brunswick, 45; in Quebec, 140; in Ontario, 74; in Manitoba, 11, and in British Columbia, 15.

The total value of the work in any province must not be altogether determined in the mind of the reader by the number of points at which the expenditure was made. The expense incurred at the 133 places in Nova Scotia does not exceed the sum of \$217,000, whilst that in Ontario, although expended at only 74 places, amounts to close upon \$900,000. In Nova Scotia, and in parts of the province of Quebec, a large proportion of the expenditure is made for the purpose of helping the fishermen to carry on their often dangerous, but to the country, highly profitable trade. Small boat-harbours are opened up for them in order to enable the fishing boats to be hauled out of reach of storms, and protected against the weather, and small breakwaters are frequently constructed to render easier the entrance of harbours. The trade carried on at each of those points may not be enormously large, but the number of people benefitted is great, the number of lives saved each year by these small expenditures is certainly remarkable, if compared with the number which was lost yearly before the improvements were executed, while the dredging performed at the most important points helps to develop and enlarge an already fast-increasing trade.

In the province of Ontario important works have been carried on in the harbours of Toronto, Collingwood, Meaford, Port Burwell, Rondeau, &c., the Chief Engineer's report giving the detail of work done at those important places. The dredging at Port Arthur, Fort William, Collingwood, and in the various harbours on Lakes Erie and Ontario, has been pushed with activity; the work of the dredges owned by the government being supplemented by that of hired dredges owned by private parties. To the government fleet on the upper lakes will be added for next season a new dipper dredge, the *Progress*, constructed by the department at the Sorel yards, this dredge being of the spoon type, 90'10 feet long by 31'2 wide, and 10'1 feet in depth, with a 4½ cubic yard dipper.

In the province of Quebec the works at Maisonneuve are approaching a successful termination, those at Sorel are completed, and a commencement has been made of an important addition to the Quebec wharfs. The reports of the Chief Engineer gives a detailed description of the other works in this province, as well as of those in the maritime provinces, to which I can only make here a passing reference.

While the works to which I refer have been executed, care has also been taken to look into the demands for further improvements, and for that purpose a number of examinations have been made, amounting in total to 281 during the year. Those examinations have required, in many cases, a rather prolonged stay at each place by the inspecting engineer for the purpose of examining the local conditions, in order to permit of proper reports being made and proper designs being prepared to arrive at the estimated cost of the demands for new improvements. If to that number of 281 be



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added the number of works executed in each of the provinces, which amounts to 455, we come to a grand total of 736 points where improvements or surveys have been made in the Dominion under the superintendence of the Chief Engineer and his assistants.

#### DREDGING OPERATIONS.

Outside of the construction of piers and breakwaters (the detail of which is given in the chief engineer's annual report, appendix 4 hereto), the most important part of the work performed under his direction, has certainly been that covered by the dredging operations of the department throughout Canada.

The fleet at the disposal of the department, to do that work, comprises nineteen dredges with their complement of tugs, scows and coal barges, amounting altogether to 101 vessels of every description. The total amount covered by the dredging operations reaches a sum of \$587,190.28, the greatest amount in any province, for dredging, being in Ontario, where the expenditure under that head was \$342,387.97. If the amount expended for deepening the ship channel between Montreal and Quebec, where the expenditure has amounted to \$255,776.55, be added to the other dredging expenditure of the province, amounting in all to \$84,593.69, the grand total for Quebec, including the expenditure on the national highway to the sea, would reach the total of \$340,370.24.

The dredging in the maritime provinces has been conducted by means of seven dredges: the *St. Lawrence*, *Canada*, *New Dominion*, *Prince Edward*, *George MacKenzie*, *Cape Breton* and *New Brunswick*.

With the exception of the *Cape Breton* and *New Brunswick*, the other dredges are old and of ancient type. Their output is no longer in proportion with the expenditure incurred, nor is their rapidity of work in keeping with the ever-increasing need for the improvement of channels in the eastern provinces. The total number of cubic yards excavated by that fleet of dredges during the year under review, amounted to 389,443 cubic yards. The department has taken into serious consideration the improvement of the dredging fleet in the maritime provinces, both as regards their number and capacity, and parliament has thoughtfully granted the necessary votes for such improvements.

The dredge *W. S. Fielding*, now under construction at Sorel, will, it is hoped, be fully completed at the end of the present calendar year (1904). When completed, this dredge will be a beautiful vessel, 250 feet long by 42 feet wide and 18 feet in depth, of the combined hydraulic and elevator type. The boat will be a self-propeller and, being built of steel, will have lasting qualities which will permit of its usefulness being exerted to the greatest degree for the work which she will be called on to perform.

A new hydraulic dredge is also to be provided for the maritime provinces, as well as a spoon dredge, to take the place of the *Prince Edward*.

The construction of a dredge on modern lines, and of the type which will give the most satisfactory results with the minimum expenditure of money, is a matter which



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unfortunately requires time. Various attempts have been made, and are now being made, to purchase dredges for the department, but the improvements going on, at all points in the United States and in Canada, give employment to mostly all the good dredges which are afloat, so that none but the old machines are now offered for sale, and the department has, perforce, to resort to the construction of such dredges under its own supervision.

That the system of constructing the dredges we require is, after all, the best—if it does not prove to be the quickest mode of procedure—is shown in the result obtained by the dredges operating on the ship channel between Montreal and Quebec. On the great national highway to the sea, six elevator dredges and one hydraulic dredge have been in operation during the fiscal year under review. Those dredges are the *Laval* and the *Laurier*, two wooden vessels of 150 and 160 feet in length respectively; the *Lady Aberdeen* and *Lady Minto*, two vessels of the same type, built of steel, and having a length of 148 feet each; two new wooden dredges, the *Lafontaine* and *Baldwin*, having a length of 168 feet respectively, and the hydraulic dredge *J. Israel Tarte*, built of steel and having a length of 160 feet. All those dredges were built by and under the immediate control of the department, the *Laval* and *J. I. Tarte* having been built by contract, and the five others having been constructed at the government shipyards at Sorel.

During the season under review the fleet of dredges in question has removed a total quantity of 6,544,605 cubic yards, at an aggregate cost, for these dredging operations, of \$255,776.55, or at the rate per yard of  $3\frac{9}{10}$  c. Prominent in that work is the performance of the dredge *J. I. Tarte*, which, in a period of 127 days of actual work, removed 2,333,200 cubic yards at a cost of \$57,846.51, or an average cost per cubic yard of 2.48 cents per yard. During the month of September last, in a period of 25 days, when the dredge was actually at work for 83 per cent of the actual possible time of 132 hours per week, this dredge removed 750,100 cubic yards, or an average of 30,000 yards per day, or 1,250 yards per hour—an output which, I believe, is not excelled or equalled by any dredging machine now afloat on any water in the world.

## SHIP CHANNEL.

I may be permitted here to say a few words in reference to the work performed, and to be performed, in the channel between Montreal and Quebec. The total length of the waterway between those two cities is placed at 160 miles, of which the natural channel, not requiring improvement, covers  $97\frac{1}{2}$  miles, whilst there are  $62\frac{1}{2}$  miles of improved channel. There is no tide for the 82 miles between Montreal and Three Rivers, and over the 20 miles from Three Rivers to Batiscan the tide is not useful for navigation. Over the 22 miles from Batiscan to Portneuf, the tide is helpful to navigation for six hours during each twelve hours, and in the 36 miles from Portneuf to Quebec the tide ranges from 9 to 15 feet of rise. The average current throughout is  $2\frac{1}{2}$  miles per hour, the strongest being found at St. Mary's Current, Montreal; at Cap à la Roche, and in the Richelieu Rapids; the most gentle in Lake St. Peter. On an average, navigation closes in the St. Lawrence on November 25 and opens on April 10, giving about  $7\frac{1}{2}$  months of navigation. The standard depth in the channel is  $27\frac{1}{2}$  feet, for a width of 300 feet, but improvements have been going on for the past years with a



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view of giving a channel of 30 feet in depth with a width of 400 feet in the tangents, and from 500 to even 750 feet in the bends.

37.10 miles of the 30 foot channel have been dredged, being 21.80 miles from Montreal to Sorel. 4.90 miles from Sorel to Batiscan, .90 mile between Batiscan and Quebec, and 9½ miles in Lake St. Peter, where the dredge *J. I. Tarte* is at work.

In 1884, when the improvements were begun in the channel, there was only a depth of 11 feet in Lake St. Peter. The channel there is, throughout, 27½ feet in depth and 30 feet, as before stated, for 9½ miles of the distance.

The usual careful testing was carried on during last season, and no boulders nor obstructions had been found in the channel during that period. Since operations of improvement by dredging were begun, in the forties, to June 30, 1903, the total quantity of material excavated has amounted to 36,654,660 cubic yards, at a grand total expenditure of \$4,910,155.62.

During the year 1903, 802 ocean-going vessels have gone up and down this channel, this number being 45 in excess of that of 1902. The total tonnage has reached the figure of 1,900,000 tons, or 350,000 tons more than in any previous year; the daily tonnage being calculated to be equal to that which would be carried by 80 trains daily.

In the province of Manitoba the dredging appliances which were obtained some years ago, have been found to be behind the times, and improvements are now in progress which will enable the department to carry on the work at less cost and with more rapidity than heretofore.

In British Columbia the new dredges *King Edward* (a hydraulic dredge) and the *Nakusp*, operating on the Arrow lakes have done very satisfactory work, and the department is now taking steps to replace the dredge *Mudlark*, which was purchased some years ago and appears to have outlived her usefulness.

The department hopes that within a short time its equipment in dredging appliances will enable it to cope successfully with the ever increasing demands for that class of work.

#### TRANSPORTATION.

I may here make a passing note of the commencement of the work of the transportation commission, composed of Messrs. John Bertram, chairman, E. C. Fry, of Quebec, and Robert Reford, of Montreal, with Messrs. C. N. Bell and J. X. Perreault as joint secretaries. The commission, which has set to work and begun its operation by investigating the conditions in the maritime provinces, is following its work by further investigation in the province of Ontario and the west.

#### PUBLIC BUILDINGS.

Having rapidly gone over the work performed for the advantage of navigation, permit me to refer to another important branch of the department, that which concerns



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the construction and maintenance of the public buildings disseminated throughout the Dominion, and which are under the charge of the Department of Public Works.

As I have stated at the beginning of this report, the total expenditure made on buildings has amounted to \$1,539,005.60.

This expenditure is spread over 272 buildings in the Dominion, and has covered not only the expenditure for the construction of new edifices, but that required for the maintenance of those already constructed, their repair, heating, lighting, &c.

During the year 1902-03 the following buildings were either begun or were in course of construction:—

*Nova Scotia—*

Arichat public building.  
Guysboro public building.  
Halifax public building.  
Middleton armoury.

*New Brunswick—*

Marysville public building.  
Richibucto public building.

*Quebec—*

Granby public building.  
L'Assomption public building.  
Quebec Artillery workshops.  
Quebec iron foundry.

*Ontario—*

Clifton public building.  
Deseronto public building.  
Fort William public building.  
Guelph (alterations).  
London drill hall (construction).  
Ottawa Observatory (construction).  
Sarnia (construction).  
Toronto, Postal Station C (construction).

*North-west Territories—*

Carnduff court house.  
Edmonton jail.  
MacLeod court house.  
Saskatoon court house.  
Yorkton court house.  
Red Deer court house.



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*British Columbia—*

Kamloops armoury.

Kaslo armoury.

Nelson armoury.

Revelstoke armoury.

Nelson public building.

Rossland public building.

Of the above, the following buildings were completed during the year under review: Middleton, Marysville, Granby, Quebec artillery workshops, Deseronto, Carn-duff, Saskatoon, and all the buildings above named in British Columbia.

The cost of heating the public buildings throughout the Dominion amounted, during the year, to \$114,780.89, and that for lighting purposes to \$90,051.03.

It has been the aim of the Chief Architect to keep the buildings throughout in as good a state of repair as the grants given by parliament would allow, the several caretakers of those buildings reporting regularly on repairs required, the same being well looked after by the Chief Architect and his efficient staff.

There has been only one casualty to report in connection with the public buildings for the year. An unfortunate accident occurred in the public building at Springhill, N.S., where, owing to the explosion of the heating furnace, the caretaker was instantly killed and another man, employed by the Robb Engineering Co., of Amherst, was seriously wounded. Fortunately, after having been in the hospital for some time, the latter has recovered from his injuries.

The Chief Architect is now at work preparing the plans for several of the important buildings for which money was granted at the last session of parliament, the most important being certainly the Victoria National Museum at Ottawa, for the construction of which a site has been procured and the plans are well advanced.

## TELEGRAPHS.

The telegraph service of the department has been well looked after during the year by the Superintendent of telegraph service. The total number of miles of telegraph lines under the control of the department is 6,244½ miles, comprising 259 offices, transmitting during the year under review a total of 96,500 messages.

The lines in Yukon territory have been, during the last winter, operated much more satisfactorily than during the previous year, climatic conditions having been more favourable. While during the winter of 1902-3 the line could not be worked for the greater part of the month of January, and only spasmodically during February, there has not been, during the course of last winter, one single day in which, if an interruption occurred, the line was not during the same day in sufficient working condition to enable messages to pass through to Dawson.



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The returns for the line during the last fiscal year is about equal to the returns of the preceding year, while the expenditure for maintenance has also been about the same.

Several new lines have been established in the province of Quebec; steps have been taken to substitute a land line in place of the cables between Bersimis and Godbout, where frequent interruptions occurred, and the line on the north shore of the St. Lawrence to Belle Isle has been kept in good and efficient working condition.

This branch of our service has been well administered, and the praise given to the Chief Engineer and the Chief Architect can in no way be diminished when it is addressed to the Superintendent of telegraphs.

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In Part No. 2 will be found the financial statement prepared with his usual care and attention by the Accountant, and in No. 6 the interesting report of the Collector of Revenue.

I would also draw special attention to a well written and entertaining report by Mr. A. St. Laurent on the construction under his superintendence of an extensive grain elevator in the harbour of Montreal, which will be found at pages 235 to 251 of Part 4, the Chief Engineer's report.

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Before concluding this report, I may say that the review of the work of our department during the twenty years following 1882, to which I referred in last year's report, has been continued with as much rapidity as the abnormal length of last session and the consequent doubling up of work since its close, have permitted me to do. I hope that before the next session of parliament closes, I will be in a position to submit to you a copy of the work in question, which I anticipate will be a credit to the department.

I beg to offer the expression of my utmost satisfaction to all the employees of the department who have assisted in carrying on so successfully the very important works entrusted to them and to myself during the year under review, and I must say that they all deserve the greatest praise for the manner in which they have acquitted themselves of their duties.

I have the honour to be, sir,

Your obedient servant,

A. GOBEIL,

*Deputy Minister.*







PART II.

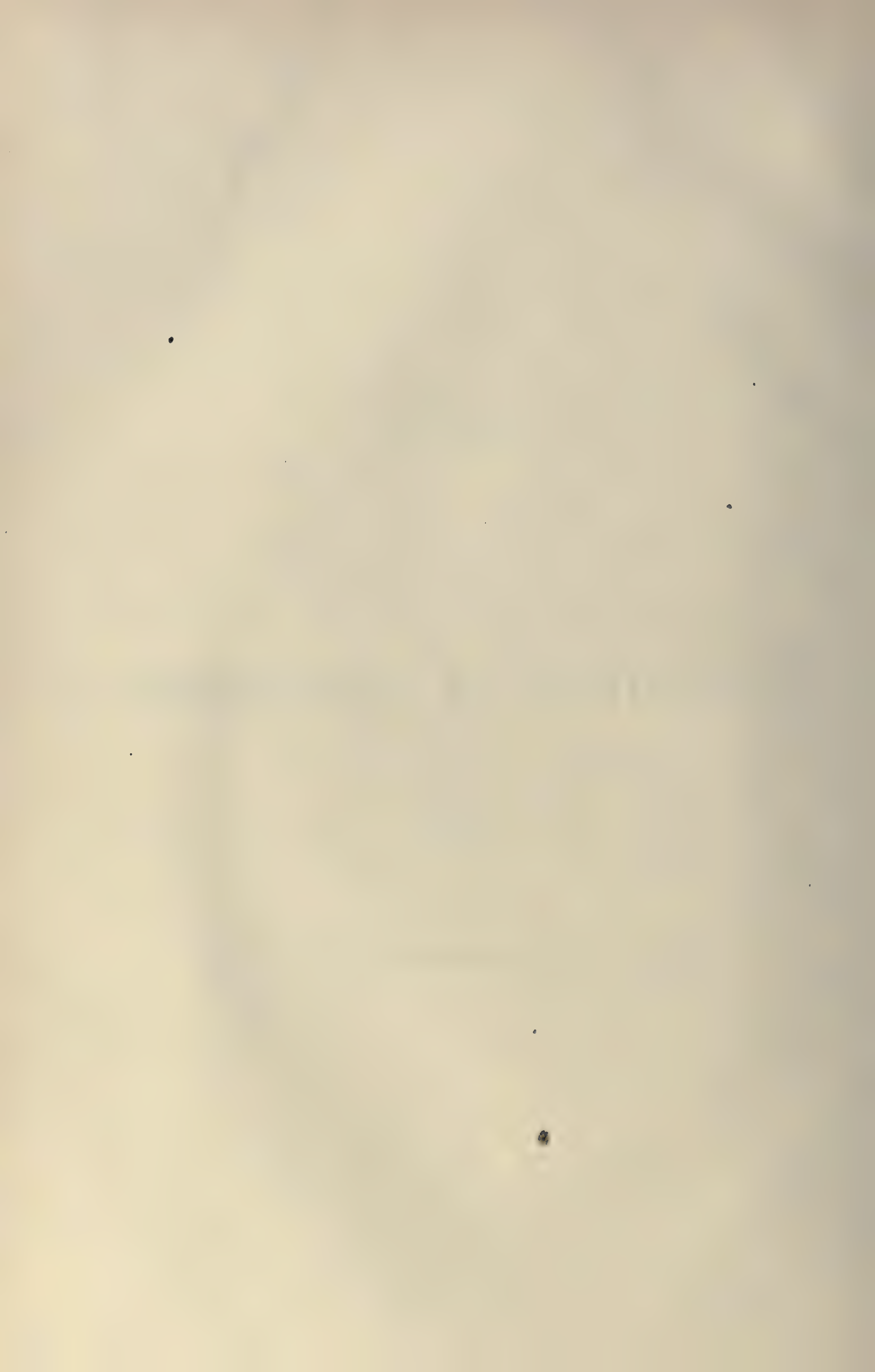
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STATEMENTS OF EXPENDITURE

DURING

FISCAL YEAR ENDED JUNE 30, 1903.







PART II.

STATEMENT A.—Showing the Amounts expended by the Department of Public Works of Canada during the fiscal year ending June 30, 1903.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
PUBLIC BUILDINGS.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.				
Amherst, post office, &c..		269 86		269 86
Annapolis, post office, &c..		854 72		854 72
Antigonish, post office, &c..		25 09		25 09
Arichat, post office, &c..	5,092 82			5,092 82
Baddeck, post office, &c..		150 57		150 57
" armoury	1,650 00			1,650 00
Dartmouth, post office, &c..		5 00		5 00
Digby, post office, &c..		122 35		122 35
Guysboro, post office, &c..	14,343 52			14,343 52
Halifax Asst. Receiver Gen. Office		27 73		27 73
" Dominion Building		1,643 27		1,643 27
" " " power for elevators			179 20	179 20
" drill hall		396 12		396 12
" engineer's office		32 75		32 75
" examining warehouse		89 54		89 54
" " " power for elevator			77 42	77 42
" immigrant building	336 04	508 26		844 30
" quarantine station (Lawlor's Island)		2,191 63		2,191 63
" new custom house	49,065 92			49,065 92
Kentville, post office, &c..		174 30		174 30
Liverpool, post office, &c..		42 64		42 64
Lunenburg, post office, &c..		61 23		61 23
Middleton armoury	7,043 51			7,043 51
Nappan, experimental farm	10 20	19 98		30 18
New Glasgow, post office, &c..		1,041 58		1,041 58
North Sydney, post office, &c..		437 48		437 48
" " quarantine station	1,509 68			1,509 68
Pictou, post office, &c..		2,117 47		2,117 47
Springhill, post office, &c..	2,349 95	231 93		2,581 88
Sydney, post office, &c..	1,949 55	108 13		2,057 68
Truro, post office, &c..		989 05		989 05
Windsor, post office, &c..		7 98		7 98
Yarmouth, post office, &c..		362 26		362 26
Heating, lighting, water, &c., for all buildings in Nova Scotia. (For details see page 22).			30,320 40	30,320 40
Totals, Nova Scotia	83,351 19	11,910 92	30,577 02	125,839 13
Prince Edward Island.				
Charlottetown, Dominion building		627 19	500 00	1,127 19
" marine hospital		6 50		6 50
" quarantine station		538 39		538 39
Montague, post office, &c..		21 48		21 48
Summerside, post office, &c..		41 77		41 77
Heating, lighting, water, &c., for all buildings in Prince Edward Island. (For details see page 22).			5,830 94	5,830 94
Totals, Prince Edward Island		1,235 33	6,330 94	7,566 27



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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
PUBLIC BUILDINGS— <i>Continued.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>New Brunswick.</i>				
Bathurst, post office, &c . . . . .	1,850 00	258 40		2,108 40
Carleton, post office, &c . . . . .		1,175 50		1,175 50
Chatham, post office, &c . . . . .		150 48		150 48
Chatham, quarantine station . . . . .		55 00		55 00
Dalhousie, post office, &c . . . . .		291 27		291 27
Fredericton, military building . . . . .	47 98			47 98
" post office, &c . . . . .		1,201 20		1,201 20
Marysville, post office, &c . . . . .	9,683 17			9,683 17
Moncton, post office, &c . . . . .		368 51		368 51
Newcastle, post office, &c . . . . .		787 38		787 38
Portland (St. John), post office, &c . . . . .		247 86		247 86
Richibucto, post office, &c . . . . .	2,995 34			2,995 34
St. John, custom house . . . . .		1,038 76		1,038 76
" immigration building . . . . .	10,009 12	311 66		10,320 78
" post office . . . . .		905 79		905 79
" quarantine station . . . . .	1,565 87			1,565 87
" savings bank . . . . .		141 70		141 70
" buildings generally . . . . .			173 17	173 17
St. Stephens, post office, &c . . . . .		17 15		17 15
Sussex, armoury . . . . .	4,249 20			4,249 20
" post office . . . . .		118 31		118 31
Tracadie Lazaretto . . . . .		514 01		514 01
Woodstock, post office, &c . . . . .	500 00	37 53		537 53
Heating, lighting, water, &c., for all buildings in New Brunswick. (For details see page 22). . . . .			23,926 96	23,926 96
Totals, New Brunswick . . . . .	30,900 68	7,620 51	24,100 13	62,621 32
<i>Maritime Provinces.</i>				
Generally . . . . .			980 08	980 08
<i>Quebec.</i>				
Aylmer, post office . . . . .		206 84		206 84
Berthierville, post office . . . . .		400 78		400 78
Buckingham, post office . . . . .		960 65		960 65
Coaticook, post office, &c . . . . .		7 75		7 75
Drummondville, post office, &c . . . . .	1,436 61	53 60		1,490 21
Dundee, custom house . . . . .		502 94		502 94
Granby, post office, &c . . . . .	10,987 44			10,987 44
Grosse Isle, quarantine station . . . . .	10,088 58	2,204 96		12,293 54
Fraserville, post office, &c . . . . .		73 89		73 89
Hochelaga, post office, &c . . . . .		826 79		826 79
Hull, post office, &c . . . . .	1,300 00	375 05		1,675 05
Joliette, post office, &c . . . . .		66 09		66 09
Lachine, post office, &c . . . . .		40 75		40 75
Laprairie, post office, &c . . . . .		484 34		484 34
L'Assomption, post office, &c . . . . .	4,970 98			4,970 98
Levis, cattle quarantine station . . . . .		5,417 23		5,417 23
Montmagny, post office, &c . . . . .		281 69		281 69
Montreal, custom house . . . . .		4,799 61		4,799 61
" examining warehouse . . . . .	15,054 14	310 44		15,364 58
" immigration building . . . . .		125 00		125 00
" inland revenue building . . . . .		239 29		239 29
" post office . . . . .	2,157 83	6,414 22		8,572 05
" post office, power for elevators, &c . . . . .			3,801 15	3,801 15
" public buildings generally . . . . .			32 60	32 60
Quebec citadel, Governor General's quarters . . . . .		3,413 49		3,413 49
" clerk of works office . . . . .		117 50		117 50
" culler's office . . . . .		31 00		31 00
" custom house . . . . .		539 77		539 77
Carried forward . . . . .	45,995 58	27,893 67	3,833 75	77,723 00



## SESSIONAL PAPER No. 19

PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
<b>PUBLIC BUILDINGS—<i>Continued.</i></b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>
Brought forward . . . . .	45,995 58	27,893 67	3,833 75	77,723 00
<i>Quebec—Continued.</i>				
Quebec engineer's office . . . . .		78 40		78 40
" examining warehouse . . . . .		450 74		450 74
" immigration building, (Louise Embankment). . . . .		3,153 39		3,153 39
" immigration office . . . . .		124 09		124 09
" King's Wharf building . . . . .		155 69		155 69
" Military buildings :				
Artillery workshops . . . . .	16,418 56			16,418 56
Cartridge factory . . . . .		66 77		66 77
Iron foundry . . . . .	20,360 46			20,360 46
Quebec, post office . . . . .		4,302 72		4,302 72
" " power for elevators . . . . .			300 00	300 00
Peribonka, immigrant shed . . . . .		72 05		72 05
Richmond, post office, &c . . . . .		581 89		581 89
Rimouski, " . . . . .		29 18		29 18
Roberval, immigrant shed . . . . .		642 35		642 35
Sherbrooke, post office, &c . . . . .		859 27		859 27
Sorel, post office, &c . . . . .		607 98		607 98
St. Henri, post office, &c . . . . .		120 87		120 87
St. Hyacinthe, post office, &c . . . . .	4,264 54	626 40		4,890 94
St. Jerome, post office, &c . . . . .		335 00		335 00
St. Johns, post office, &c . . . . .		106 67		106 67
St. Roch, post office, &c . . . . .		18 25		18 25
Thetford Mines, post office, &c . . . . .	2,114 38			2,114 38
Three Rivers, custom house . . . . .	3,074 60	222 61		3,297 21
" post office . . . . .		1,982 27		1,982 27
Valleyfield, post office, &c . . . . .	10,398 60	31 47		10,430 07
Victoriaville, post office, &c . . . . .		148 25		148 25
West Farnham, post office, &c . . . . .		36 55		36 55
Public Bldgs Quebec, generally . . . . .			630 20	630 20
Heating, lighting, water, &c., for all Quebec Build- ings. (For details see page 22) . . . . .			78,522 66	78,522 66
Totals, Quebec . . . . .	102,626 72	42,646 53	83,286 61	228,559 86
<i>Ontario.</i>				
Almonte, post office, &c . . . . .		90 48		90 48
Amherstburg, post office, &c . . . . .		90 40		90 40
Arnprior, post office, &c . . . . .		269 95		269 95
Barrie, post office, &c . . . . .		255 50		255 50
Belleville, post office, &c . . . . .	776 86	417 54		1,194 40
Berlin, post office, &c . . . . .	365 16	82 52		447 68
Bowmanville, post office, &c . . . . .	5,000 00			5,000 00
Brampton, post office, &c . . . . .		251 11		251 11
Brantford, drill hall . . . . .		45 90		45 90
" post office, &c . . . . .		144 60		144 60
Brockville, drill hall . . . . .	4,640 00			4,640 00
" post office, &c . . . . .		589 07		589 07
Carleton Place, post office, &c . . . . .		99 49		99 49
Cayuga, post office, &c . . . . .		44 72		44 72
Chatham, post office, &c . . . . .		310 66		310 66
Clinton, post office, &c . . . . .	7,538 75			7,538 75
Cobourg, armoury . . . . .	4,000 10			4,000 10
" post office, &c . . . . .		549 87		549 87
Cordova Mines, post office, &c . . . . .		15 00		15 00
Cornwall, post office, &c . . . . .		226 45		226 45
Deseronto, post office, &c . . . . .	20,513 83			20,513 83
Dundas, drill hall . . . . .	67 39			67 39
Fort William, post office, &c . . . . .	4,999 82			4,999 82
Carried forward . . . . .	47,901 91	3,483 26		51,385 17



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PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
PUBLIC BUILDINGS—Continued.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....	17,901 91	3,483 26		51,385 17
Ontario—Continued.				
Galt, post office, &c.....		83 31		83 31
Gananoque, post office, &c.....		217 20		217 20
Goderich, post office, &c.....		105 60		105 60
Guelph, post office, &c.....	7,054 63	78 11		7,132 74
Hamilton, custom house.....		213 25		213 25
Hamilton examining warehouse.....	9,893 32			9,893 32
" post office.....		554 82		554 82
" power.....			18 77	18 77
Ingersoll post office, &c.....		40 95		40 95
Kingston custom house.....		575 73		575 73
" military college, &c.....	39,680 45			39,680 45
" post office, &c.....	674 22	389 82		1,064 04
Lindsay post office.....		16 96		16 96
London custom house.....	341 65	463 24		804 89
" drill hall.....	9,937 73			9,937 73
" post office, &c.....	355 80	351 66		707 46
Napanee ".....		71 37		71 37
Niagara Falls ".....	387 00			387 00
Orangeville ".....		35 45		35 45
Orillia ".....		47 59		47 59
Ottawa parliamentary and deptl. buildings:				
Astronomical observatory.....	15,018 72			15,018 72
Bacteriological laboratory.....	6,762 88			6,762 88
Experimental farm.....	5,157 94	2,769 05		7,926 99
Major's Hill Park.....		6,908 44		6,908 44
National Art Gallery.....	6,500 00	807 42		7,307 42
Parliament buildings.....	26,180 06			26,180 06
Post office, &c.....	27,000 00			27,000 00
Rideau Hall.....	7,514 43	21,753 71		29,268 14
" grounds, \$7,381.33; snow, \$944.42; fuel and light, \$8,000; watchman, \$547.50.....			16,873 30	16,873 30
Royal Mint.....	1,065 02			1,065 02
Generally: grounds.....			9,350 36	9,350 36
" power for elevators.....			2,824 80	2,824 80
" removal of snow.....			2,075 62	2,075 62
" repairs and furniture.....		167,500 92		167,500 92
" telephone service.....			6,999 37	6,999 37
Paris, post office, &c.....		78 12		78 12
Pembroke, post office, &c.....		50 40		50 40
Peterborough, custom house.....		22 50		22 50
" post office, &c.....		117 32		117 32
Petrollea, post office, &c.....		181 97		181 97
Picton ".....	4,175 82	87 61		4,263 43
Port Arthur, immigrant building.....		89 44		89 44
" post office, &c.....		20 20		20 20
Port Colborne ".....	695 24	222 59		917 83
Port Dalhousie, custom house.....		36 00		36 00
Port Hope, post office, &c.....		1,143 30		1,143 30
Prescott ".....	1,454 85	213 78		1,668 63
Rat Portage ".....		98 11		98 11
St. Catharines ".....		191 77		191 77
St. Thomas, armoury.....	1,873 99			1,873 99
" post office, &c.....		232 06		232 06
Sarnia ".....	34,011 02			34,011 02
Sault Ste. Marie ".....	164 42			164 42
Smith's Falls ".....		39 51		39 51
Stratford ".....		34 55		34 55
Strathroy ".....		179 75		179 75
Carried forward.....	253,801 10	209,506 84	38,142 22	501,450



## SESSIONAL PAPER No. 19

PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
<b>PUBLIC BUILDINGS—<i>Continued.</i></b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>
Brought forward.....	253,801 10	209,806 84	38,142 22	501,450 16
<i>Ontario—Continued.</i>				
Toronto, asst. receiver general's office. . . . .	1,565 46			1,565 46
" custom house.....		5,197 04		5,197 04
" drill shed .....		5,990 51		5,990 51
" engineer's office.....		13 60		13 60
" examining warehouse. ....		1,276 11		1,276 11
" generally.....			1,028 85	1,028 85
" inland revenue.....		273 24		273 24
" Junction building.....	2,902 98			2,902 98
" postal station 'C'.....	28,108 45			28,108 45
" post office, &c.....	1,285 00	14,523 26		15,808 26
" power .....			445 68	445 68
" Union Station, bal.....	146 16			146 16
Trenton post office, &c.....		406 43		406 43
Walkerton post office, &c.....		223 92		223 92
Windsor drill hall.....	6 63			6 63
" post office, &c. ....	3,794 95	157 43		3,952 38
Woodstock drill hall.....	28 54			28 54
" post office, &c.....	934 60	258 23		1,192 83
Ontario generally.....			160 50	160 50
Heating, lighting, water, &c., for all buildings in Ontario (For details see page 23).....			239,073 37	239,073,37
Totals, Ontario .....	292,573 87	237,826 61	278,850 62	809,251 10
<i>Manitoba.</i>				
Birtle immigrant building.....		10 00		10 00
Brandon experimental farm.....		497 72		497 72
" immigrant building.....		23 04		23 04
" post office, &c. ....		324 92		324 92
Dauphin drill hall.....		8 00		8 00
" immigrant building.....		28 00		28 00
Portage LaPrairie post office, &c.....		494 67		494 67
Selkirk (east) immigrant building.....		515 45		515 45
Winnipeg custom house.....		250 18		250 18
" Dominion lands office.....		185 98		185 98
" drill shed.....		3 00		3 00
" examining warehouse.....		2,624 17		2,624 17
" immigrant buildings.....	12,211 51	2,156 85		14,368 36
" post office, &c.....		3,003 29		3,003 29
" power.....			100 17	100 17
" weights and measures office.....		57 25		57 25
Manitoba generally.....			368 05	368 05
Heating, lighting, water, &c., for all buildings in Manitoba (For details see page 25).....			19,586 79	19,586 79
Totals, Manitoba.....	12,211 51	10,182 52	20,055 01	42,449 04
<i>North-west Territories.</i>				
Battleford Dominion lands office.....		231 00		231 00
Calgary court house, &c.....	380 12	997 30		1,377 42
" custom .....		84 13		84 13
" immigrant building.....		199 74		199 74
" post office, &c.....		1,385 35		1,385 35
Carnduff court house.....	5,839 45			5,839 45
Edmonton court house.....	2,748 31	879 87		3,628 18
" Dominion lands office.....		172 27		172 27
" post office .....		87 45		87 45
Carried forward.....	8,967 88	4,037 11		13,004 99



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PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>PUBLIC BUILDINGS.</b>				
Brought forward . . . . .	8,967 88	4,037 11		13,004 99
<i>North-west Territories—Concluded.</i>				
Indian Head experimental farm. . . . .		1,162 33		1,162 33
Lacombe immigrant building. . . . .		32 25		32 25
Lethbridge court house, &c. . . . .	1,497 14	41 75		1,538 89
" immigrant building. . . . .		54 75		54 75
" post office. . . . .		3 00		3 00
Macleod court house, &c. . . . .	12,078 42			12,078 42
" custom house. . . . .	1,047 00	352 90		1,399 90
Medecine Hat court house. . . . .		167 20		167 20
Moosejaw " " . . . . .	861 48	58 60		920 08
Moosomin " " . . . . .	1,084 02	187 50		1,271 52
Prince Albert " " . . . . .		366 85		366 85
" Dominion lands office, &c. . . . .		386 48		386 48
" immigrant building. . . . .		69 25		69 25
Qu'Appelle " " . . . . .		2 50		2 50
Red Deer court house, &c. . . . .	916 15			916 15
Red Deer Valley immigrant building. . . . .	16 70			16 70
Regina court house. . . . .	764 33	329 56		1,093 89
" Dominion lands office, &c. . . . .		298 98		298 98
" Lt. Governor's residence. . . . .	2,320 50	476 40		2,796 90
" post office, &c. . . . .		175 72		175 72
St. Mary court house . . . . .		8 00		8 00
Saskatoon immigrant building. . . . .	2,817 45			2,817 45
Strathcona " " . . . . .		210 60		210 60
Wolseley court house &c. . . . .		333 18		333 18
Yorkton " " . . . . .	7,452 25			7,452 25
" Dominion lands office. . . . .		165 50		165 50
" immigrant building. . . . .		139 10		139 10
North-west Territories generally. . . . .			220 80	220 80
Heating, lighting, water, &c., for all buildings in North-west Territories. (For details see page 26)..			18,145 06	18,145 06
Totals, N.-W. Territories. . . . .	39,823 32	9,059 51	18,365 86	67,248 69
<i>British Columbia.</i>				
Agassiz, experimental farm. . . . .		379 70		379 70
Atlin post office, &c. . . . .		381 61		381 61
Kamloops armoury. . . . .	7,908 15			7,908 15
" post office, &c. . . . .		1,182 01		1,182 01
Kaslo, armoury. . . . .	4,253 59			4,253 59
Nanaimo, post office. . . . .		993 30		993 30
Nelson, armoury. . . . .	12,175 14			12,175 14
" post office, &c. . . . .	25,031 60			25,031 60
New Westminster, crown and timber office. . . . .		855 60		855 60
" custom house, &c. . . . .		146 06		146 06
" Dominion lands office. . . . .		721 30		721 30
" post office, &c. . . . .		857 42		857 42
Revelstoke, armoury . . . . .	6,618 89			6,618 89
Rossland, post office, &c. . . . .	12,047 17			12,047 17
Vancouver, drill hall. . . . .		594 10		594 10
" examining warehouse. . . . .		611 18		611 18
" post office, &c. . . . .	3,788 45	1,060 80		4,849 25
Victoria, drill hall. . . . .		16 00		16 00
" Indian office. . . . .		43 22		43 22
" post office, &c. . . . .		3,883 19		3,883 19
" power. . . . .			252 72	252 72
William's Head, quarantine station. . . . .		15,000 00	360 00	15,360 00
British Columbia, generally. . . . .			1,163 25	1,163 25
Carried forward. . . . .	71,822 99	26,725 49	1,775 97	100,324 45



## SESSIONAL PAPER No. 19

PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture	Staff and Main- tenance.	Total.
<b>PUBLIC BUILDINGS—<i>Concluded.</i></b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>	<b>\$ cts.</b>
Brought forward.....	71,822 99	26,725 49	1,775 97	100,324 45
<b><i>British Columbia—Concluded.</i></b>				
Heating, lighting, water, &c., for all buildings in British Columbia. (For details see page 26).....			22,634 07	22,634 07
Totals, British Columbia. ....	71,822 99	26,725 49	24,410 04	122,958 52
<b><i>Yukon District.</i></b>				
Yukon, public buildings..	8,999 04			8,999 04
Heating, lighting, &c., for Yukon buildings.....			44,453 27	44,453 27
Totals, Yukon District.....	8,999 04		44,453 27	53,452 31
<b><i>Public buildings generally.</i></b>				
Printing, stationery, advertising, &c.....			6,143 74	6,143 74
Salaries of resident clerks of works, &c.....			11,935 54	11,935 54
Totals, generally.....			18,079 28	18,079 28



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PART II—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Main- tenance.	Total.
HARBOURS AND RIVERS.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Nova Scotia.</i>					
Amaguadees Pond wharf.....		485 60			485 60
Arisaig, repairs to pier .....			899 81		899 81
Back Bay.....			75 76		75 76
Bailey Brook .....		2,000 00			2,000 00
Bass River.....			56 06		56 06
Burnt Church.....			4 95		4 95
Bear River.....			1,611 35		1,611 35
Big Pond.....			84 79		84 79
Boularderie .....		2,499 79			2,499 79
Brooklyn wharf.....		556 09			556 09
Burlington wharf. ....		1,590 79			1,590 79
Canada Creek breakwater.....		499 96			499 96
Cape Cove.....		3,000 00			3,000 00
Cape Auger.....		912 83			912 83
Cariboo Island.....		650 06			650 06
Cheggoggin.....			76 58		76 58
Cheticamp.....		123 38			123 38
Charlesville breakwater.....		2,700 20			2,700 20
Cheverie " .....		2,999 34			2,999 34
Church Point. ....			1,800 00		1,800 00
Comeau breakwater.....		1,202 37			1,202 37
Comeau's Hill breakwater.....		599 72			599 72
Comeauville.....			1,998 49		1,998 49
Cow Bay (Port Morien). ....			10,005 00		10,005 00
Cribbin's Point.....			1,357 87		1,357 87
Digby.....	765 07		3,697 77		4,462 84
" "Racquette" hand dredging.....	496 38				496 38
Drumhead breakwater.....		638 76			638 76
Eagle Head .....			148 03		148 03
East Bay (North Side) .....			600 00		600 00
East-Berlin breakwater.....		1,999 94			1,999 94
Ecum Secum wharf.....			127 86		127 86
Englishtown " .....			32 05		32 05
Faulkner's Creek.....			100 24		100 24
Finlay's Point wharf.....		529 78			529 78
Fort Lawrence, landing pier.....		109 16			109 16
French River .....			391 82		391 82
Friars' Head, boat harbour .....		629 96			629 96
Granville Centre, wharf .....		857 00			857 00
Grand Narrows, repairs to wharf.....			1,300 66		1,300 66
Grand Etang.....		1,020 00			1,020 00
Green Cove.....		91 18			91 18
Gros Nez, repair to breakwater.....			384 51		384 51
Halifax graving dock.....				10,000 00	10,000 00
Hampton.....			207 63		207 63
Hawk Point inlet.....		215 71			215 71
Herring Cove.....		3,820 05	35 00		3,855 05
Hunts Point breakwater.....			449 41		449 41
Iona wharf. ....		3,194 10			3,194 10
Indian Brook Flats, Cape Sable Isl.w'f.		2,648 81			2,648 81
Ingonish (North Bay).....		1,515 52			1,515 52
Irish Cove, repairs to wharf.....			499 96		499 96
Island Point " " .....			513 37		513 37
Isaac's Harbour.....			723 19		723 19
Judique, repair, &c., to breakwater.....			898 77		898 77
Kempt Head .....		719 56			719 56
Kingsport.....		4,934 60			4,934 60
L'Ardoise, breakwater.....		25 57			25 57
Larrys River " .....		749 81			749 81
Lennox passage .....		999 90			999 90
Lingan, beach protection.....		599 89			599 89
Little Bras d'Or wharf .....		2,287 50			2,287 50
Carried forward.....	1,261 45	47,406 93	28,080 93	10,000 00	86,749 31



## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS—Con.					
Brought forward . . . . .	1,261 45	47,406 93	28,080 93	10,000 00	86,749 31.
Nova Scotia—Con.					
Little Harbour, (or Arnold Point) . . . . .		138 68			138 68
Little Narrows . . . . .			499 04		499 04
Liverpool . . . . .	12,225 55				12,225 55
Livingstone's Cove . . . . .		1,519 51			1,519 51
Lower Cove, breakwater . . . . .		1,301 86			1,301 86
Lower West Pubnico . . . . .		1,000 00			1,000 00
McNairs Cove . . . . .		1,094 58			1,094 58
Mabou Harbour . . . . .			1,198 71		1,198 71
Main à Dieu . . . . .		103 60			103 60
Maitland—repairs to wharf . . . . .			1,398 61		1,398 61
Malignant Cove . . . . .		799 94			799 94
Margaree Harbour . . . . .		482 32			482 32
Margaree Island . . . . .			6 40		6 40
Meteghan (Cove) . . . . .		2,999 47			2,999 47
Meteghan River . . . . .		942 41			942 41
Minudie Wharf . . . . .		1,310 51			1,310 51
Monk's Head . . . . .			139 07		139 07
Necum Teuch wharf . . . . .		790 13			790 13
Neils Harbour, breakwater . . . . .		13,892 50			13,892 50
New Harbour, breakwater, &c . . . . .		5,999 77			5,999 77
North River, St. Anns . . . . .			45 88		45 88
North Sydney . . . . .	4,839 40				4,839 40
Nyanza Wharf . . . . .			257 79		257 79
Ogdens Pond . . . . .		649 87			649 87
Parker's Cove . . . . .		10,212 60			10,212 60
Parrsborough . . . . .			10 62		10 62
Pereaux, landing pier . . . . .		1,329 96			1,329 96
Petit de Grat . . . . .			90 91		90 91
Pictou Island . . . . .	7,087 07		942 56		8,029 63
Pinkney's Cove . . . . .			48 69		48 69
Plymouth . . . . .			97 38		97 38
Poirierville or Lower d'Escousse . . . . .		438 96			438 96
Porters Lake . . . . .		2,455 67			2,455 67
Port George breakwater . . . . .		2,297 46			2,297 46
Port Greville . . . . .		4,071 10			4,071 10
Port Hawkesbury . . . . .		2,718 01			2,718 01
Port Hood . . . . .			199 99		199 99
Port La Tour . . . . .		1,009 94			1,009 94
Port Larue . . . . .			1,198 48		1,198 48
Prospect . . . . .		767 26			767 26
Ragged Head, Channel protection . . . . .		1,000 00			1,000 00
Round Bay . . . . .		2,326 81			2,326 81
Sandford or Cranberry Head, breakwater . . . . .		1,004 47			1,004 47
Sandy Cove, breakwater . . . . .		2,510 51			2,510 51
Shag Harbour . . . . .			21 05		21 05
Short Beach . . . . .		1,773 10			1,773 10
Sonora . . . . .	2,204 33				2,204 33
Sober Island . . . . .		797 18			797 18
South Gut, St. Ann's . . . . .			1,248 12		1,248 12
South Ingonish wharf . . . . .		60 37			60 37
South West,—Port Mouton . . . . .			1,500 00		1,500 00
St. Ann's Beach, protection work . . . . .		1,749 89			1,749 89
St. Mary's River (Guysborough) . . . . .	4,135 51				4,135 51
Summerville breakwater . . . . .		999 69			999 69
Three Fathom Harbour . . . . .		1,785 57			1,785 57
The Gate. Improvements of Channel between Comeaux Hill Point and Big Tusket Island . . . . .		1,000 00			1,000 00
Tidnish . . . . .			1,066 13		1,066 13
Tiverton . . . . .		2,518 16			2,518 16
Carried forward . . . . .	31,753 31	123,258 79	38,050 36	10,000 00	203,062 46



3-4 EDWARD VII., A. 1904

PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
HARBOURS AND RIVERS—Con.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....	31,753 31	123,258 79	38,050 36	10,000 00	203,062 46
Nova Scotia—Con.					
Tracadie East. ....			381 64		381 64
Tusket Wharf. ....		580 08			580 08
Victoria Pier.....			653 53		653 53
Washabuck Wharf.....		182 92			182 92
Wedge Point.....			1,000 00		1,000 00
West Baccaro.....		2,000 00			2,000 00
West Bay, Richmond (South Side).....			134 26		134 26
Western Head.....		2,958 55			2,958 55
Whitewater.....			881 98		881 98
Whitehaven.....			799 25		799 25
Whycocomagh.....			450 00		450 00
Yarmouth Bar.....			120 94		120 94
Generally, Nova Scotia.....				3,480 22	3,480 22
Totals, Nova Scotia.....	31,753 31	128,980 34	42,471 96	13,480 22	216,685 83
Prince Edward Island.					
Bay Fortune Breakwater.....			999 84		999 84
Belfast Pier.....			10 00		10 00
Blooming Point.....			41 75		41 75
Brae Breakwater.....			388 25		388 25
Campbell's Cove.....		799 24			799 24
Canoe Cove.....		3,172 39			3,172 39
Cascumpec Harbour.....		1,904 76			1,904 76
Chapel Point.....			1,099 25		1,099 25
Cove Head Harbour.....		1,289 40			1,289 40
Cranberry Pier.....			1,126 77		1,126 77
Crapaud.....			199 13		199 13
Gaspereau.....		500 00			500 00
Georgetown Pier.....			4,405 26		4,405 26
Halliday's Wharf (Queen's Co).....	1,524 24				1,524 24
Hickey's Pier.....			253 12		253 12
Lamberts Pier.....			99 70		99 66
Lewis Point.....			100 06		100 06
Lower Montague (Aitkin's Whf).....		2,163 99			2,163 99
Mininigash. ....	181 26		501 79		683 05
Montague Bridge.....	10,444 38				10,444 38
Morrison's Beach.....			399 86		399 86
Murray Harbour South.....	508 30				508 30
Murray River.....	1,823 11				1,823 11
" " (Railway).....	1,860 20				
Less refun'd by P.E.I. Railway.....	1,800 00	60 20			60 20
New London.....			745 93		745 93
Pownall Pier.....			954 64		954 64
Red Point, repairs to wharf.....			1,100 80		1,100 80
Rustico.....			108 26		108 26
Skidders Pond.....			30 00		30 00
St. Mary's Bay.....			549 85		549 85
Stephen's Pier.....			99 69		99 69
St. Peters Bay breakwater.....		1,108 81			1,108 81
Souris, Knight's Point.....		19,680 12			19,680 12
Tignish, rebuilding northern breakwater.....		732 41			732 41
Wood Islands.....		3,008 16			3,008 16
Harbours generally (P.E.I).....				1,075 85	1,075 85
Totals P. E. Island.....	14,541 49	34,359 28	13,213 95	1,075 85	63,190 57



## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS.—<i>Con.</i></b>					
<i>New Brunswick.</i>					
Anderson's Hollow .. .. .			5,747 52		5,747 52
Bathurst.....		1 069 29			1,069 29
Bay du Vin, wharf.....		4,004 95			4,004 95
Black Brook (Loggieville) .. .		1,007 42			1,007 42
Campbellton wharf .. .		226 50			226 50
Campobello (Wilson's Beach)...		4,004 84			4,004 84
Cape Tormentine.....	9,004 92		14,788 21		23,793 13
Caraquet wharf .. .		5,627 34			5,627 34
Chockfish River .. .		1,839 70			1,839 70
Clifton (Stonehaven).....		2,500 00			2,500 00
Dipper Harbour.....			5 97		5 97
Dorchester, Coles Point. ....		23,233 62			23,233 62
Grande Anse.....		4,586 98			4,586 98
Grand Lake Flats.....	6,955 36				6,955 36
Hopewell Cape.....		16,500 69			16,500 69
Hopewell Hill.....			504 93		504 93
Little Salmon River .. .		799 48			799 48
Lord's Cove—Deer Island.....		999 97			999 97
Mizonette.....			697 61		697 61
Mispec Harbour.....		1,182 73			1,182 73
Neguac .. .			4,419 06		4,419 06
Partridge Island (St. John).....		1,250 01	52 00		1,302 01
Pointe du Chêne.....	6,982 81		499 47		7,482 28
Quaco .. .			673 34		673 34
Red Store wharf.....			700 00		700 00
Richibucto.....		16,555 25			16,555 25
River St. John, Chapel Bar (York Co.).	2,209 96				2,209 96
" Russell Bar .. .	7,832 63				7,832 63
River St. John, including tributaries—					
Grand Falls.. .. \$	1,716 84				
Green River.....	287 09				
St. Francis .. .	200 00				
Serpentine.....	400 00				
Tobique.....	300 00				
Upper St. John.....	1,609 22				
		4,513 15			4,513 15
River St. John (wharf at Oromocto) .. .		379 54			379 54
St. Andrews, repairs to wharf.....			799 62		799 62
St. John Harbour (Negro Point b'water)		20,067 29			20,067 29
St. John Harbour and protection work at base of Fort Dufferin.....			2,039 63		2,039 63
St. Louis.....			417 83		417 83
St. George.....			75 00		75 00
St. Mary's pier.....			198 96		198 96
Salmon River (Queen's Co.).....	3,209 72				3,209 72
Shippegan Harbour.....			1,999 76		1,999 76
Shippegan, wharf at Lameque.....		5,904 84			5,904 84
Upper Salmon River (Alma Pier) .. .		555 43			555 43
Generally.....				3,480 21	3,480 21
Totals, New Brunswick.....	36,195 40	116,809 02	33,618 91	3,480 21	190,103 54
<i>Quebec.</i>					
Anse à Beaufils .. .		476 12			476 12
Anse St. Jean. ....			657 91		657 91
Ashouapmouchouan.....				65 22	65 22
Belœil wharf.....			553 00		553 00
Boucherville .. .	2,154 35		880 55		3,034 90
Baie St. Paul, repairs to wharf at Cap aux Corbeaux.....			1,806 44		1,806 44
Baie St. Paul, isolated block.....			395 69		395 69
Carried forward.....	2,154 35	476 12	4,293 59	65 22	6,989 28



3-4 EDWARD VII., A. 1904

## PART II.—STATEMENT A.—EXPENDITURE—Continued

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS.—Con.</b>					
Brought forward.....	2,154 35	476 12	4,293 59	65 22	6,989 28
<b>Quebec—Con.</b>					
Berthier (en haut).....		1,354 32			1,354 32
Bic, addition and improvements to wharf.....		990 15			990 15
Bic, Pier at Pointe à Côté, &c.....		53 63			53 63
Cacouna.....			1,313 60		1,313 60
Cap à l'Aigle.....		34 75			34 75
Cap de la Madeline.....			841 02		841 02
Cap Santé.....			221 60		221 60
Carleton.....			509 20		509 20
Chicoutimi.....			8 00		8 00
Cross Point.....		4,999 47			4,999 47
Coteau Landing.....	7,293 15		213 48		7,506 63
Côte Ste. Catherine.....			493 50		493 50
Crane Island, North Side.....		2,533 62			2,533 62
" " South Side.....			4,697 53		4,697 53
Doucets Landing.....	1,677 50				1,677 50
Eboulements wharf.....			1,960 80		1,960 80
Father Point, landing pier.....		22,355 85			22,355 85
Graham wharf.....	1,065 78		317 00		1,382 78
Grande Décharge.....				17 39	17 39
Grande Vallée, pier.....		7,468 52			7,468 52
Grandes Bergeronnes.....			226 92		226 92
Green Shoals.....	53 88				53 88
Grenville.....	1,068 96				1,068 96
Grosse Isle, upper wharf.....			158 33		158 33
Hudson wharf.....		1,098 90			1,098 90
Hull, wharf.....		3,207 05	1,411 43		4,618 48
Isle aux Coudres.....		4,340 32			4,340 32
Isle Grosbois.....		5,150 75			5,150 75
Isle Verte.....			1,467 09		1,467 09
Kamouraska.....			160 30		160 30
Lake St. John, wharfs.....			1,800 76		1,800 76
Lake Temiscamingue.....		4,123 33			4,123 33
Lachine.....	905 00				905 00
Lanoraie.....			64 18		64 18
Lake St. Louis.....	964 09				964 09
Laprairie.....		4,997 08			4,997 08
Lavaltrie.....	2,650 00				2,650 00
Levis graving dock.....				13,062 53	13,062 53
Les Ecureuils.....			746 04		746 04
Le Tableau, Descente des Femmes, wharf on River Saguenay.....		4,992 54			4,992 54
L'Isle d'Alma, removal of rock.....		1,209 26			1,209 26
L'Islet.....			599 11		599 11
Longueuil.....			1,123 33		1,123 33
Lotbinière.....		2,369 42			2,369 42
Lower St. Lawrence, removal of rocks—					
Baie St. Paul.....	\$ 1 76				
Grandes Bergeronnes.....	422 07				
Indian Cove.....	18 00				
Petite Rivière Ste. Anne.....	128 36				
Les Escoumains.....	592 17				
Generally.....	28 82				
		1,191 18			1,191 18
<b>Magdalen Islands, breakwaters—</b>					
Amherst.....	\$11,798 23				
Grand Entry.....	82 06				
Grindstone.....	10,674 30				
House Harbour.....	64 25				
Pointe à Elie.....	7,787 05				
Generally.....	680 31				
		31,086 20			31,086 20
Carried forward.....	17,832 71	104,032 46	22,626 81	13,145 14	157,637 12



## SESSIONAL PAPER No. 19

PART II.—STATEMENT A.—EXPENDITURE—*Continued.*

Name of work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS—<i>Con.</i></b>					
Brought forward.....	17,832 71	104,032 46	22,626 81	13,145 14	157,637 12
<i>Quebec—Con.</i>					
Maria, isolated block. . . . .		11,991 13			11,991 13
Matane. . . . .			9 00		9 00
Mistassini . . . . .				119 56	119 56
Montreal Harbour. . . . .		251,320 47			251,320 47
Murray Bay. . . . .		1,599 89			1,599 89
New Carlisle. . . . .			67 00		67 00
Newport breakwater. . . . .		224 86			224 86
Nicolet River. . . . .	3,999 27				3,999 27
Ottawa River (Blanche shoals). . . . .	8,037 21				8,037 21
Papineauville. . . . .	1,144 00				1,144 00
Perce wharf (North Cove). . . . .		4,945 02			4,945 02
Peribonka. . . . .				28 26	28 26
Philipsburg . . . . .			580 67		580 67
Pierreville. . . . .	2,839 21				2,839 21
Pointe aux Esquimaux . . . . .		1,598 17			1,598 17
Pointe Claire. . . . .	3,925 50		150 00		4,075 50
Pointe Fortune. . . . .		5,036 51			5,036 51
Pointe St. Pierre, breakwater. . . . .		3,735 35			3,735 35
Port Daniel. . . . .			200 00		200 00
Quebec Harbour, improvements. . . . .		18,831 65			18,831 65
Rimouski wharf. . . . .			1,323 32		1,323 32
River St. Lawrence, Ship Channel. . . . .		496,634 35			496,634 35
" aux Renards. . . . .		282 54			282 54
" Bastican. . . . .	9,826 14				9,826 14
" Blanche. . . . .			750 00		750 00
Rivière Cap Chatte. . . . .			2 47		2 47
" du Nord (St. Andrews). . . . .	4,785 07				4,785 07
" Châteauguay . . . . .	5,002 30				5,002 30
" du Lièvre. . . . .			520 70	945 11	1,465 81
" des Vases . . . . .		508 05			508 05
" du Loup. . . . .			2,969 21		2,969 21
" Jesus. . . . .	1,020 00				1,020 00
" Noire. . . . .			247 96		247 96
" St. Francis, ice Pier at Richmond. . . . .		5,832 84			5,832 84
River St. Maurice Channel, between Grandes Piles and La Tuque . . . . .		8,000 04			8,000 04
Rivière St. Maurice, Mouth. . . . .	6,552 50				6,552 50
" Saguenay, beacons. . . . .				12 50	12 50
" Touladie. . . . .		47 35			47 35
Roberval. . . . .	2,531 45	4,596 68			7,128 13
Ruisseau le Blanc, breakwater. . . . .		21,077 29			21,077 29
Ste. Adelaïde de Pabos. . . . .			2,925 47		2,925 47
St. Alexis, Baie des Ha Ha, pier. . . . .		3,994 71			3,994 71
St. Alphonse de Bagotville. . . . .			1,499 65		1,499 65
St. André de Kamouraska. . . . .		999 88			999 88
Ste. Anne de Belleville. . . . .			4 35		4 35
Ste. Anne de la Pocatière. . . . .			70 15		70 15
Ste. Anne de la Pérade. . . . .			48 00		48 00
Ste. Anne du Saguenay, wharf. . . . .		1,339 07			1,339 07
Ste. Emélie. . . . .			106 51		106 51
Ste. Famille, I. O. . . . .		4,402 14			4,402 14
St. Francois, b'kwater, south shore, I.O. . . . .		4,575 89	341 66		4,917 55
St. Fulgence . . . . .		747 86			747 86
Ste. Geneviève. . . . .			136 45		136 45
St. Irénée, wharf. . . . .		6,340 25			6,340 25
St. Jean, I. O. . . . .			110 26		110 26
" Port Joli . . . . .			818 72		818 72
St. Jérôme (Lake St. John, wharf). . . . .		2,908 48			2,908 48
St. Johns. . . . .	2,742 52				2,742 52
St. Lambert. . . . .			500 09		500 09
Carried forward. . . . .	70,237 88	965,602 93	36,008 45	14,250 57	1,086,099 83



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PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
HARBOURS AND RIVERS—Con.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....	70,237 88	965,602 93	36,008 45	14,250 57	1,086,099 83
Quebec—Con.					
St. Laurent, I. O. ....			19,370 32		19,370 32
St. Louis, head gates .....				130 00	130 00
St. Marc, wharf. ....			99 45		99 45
St. Mathias wharf .....		2,497 26			2,497 26
St. Michel de Bellechasse.....			3,997 03		3,997 03
St. Nicholas.....		7,407 83			7,407 83
St. Nicholas, Island.....	4,961 69				4,961 69
St. Siméon.....			598 92		598 92
St. Sulpice.....			9 00		9 00
St. Zotique. ....			203 12		203 12
Sorel—deep water wharf.....		132,661 81			132,661 81
Tadoussac, wharf repairing.....			1,062 10		1,062 10
" extension and repairs to dam of fishbreeding establishment .....			928 42		928 42
Témiscouata lake (Notre Dame du Lac).			1,124 97		1,124 97
Three Rivers harbour. ....		49,914 21			49,914 21
Valleyfield.....	6,446 00				6,446 00
Yamaska, dam .....			2,022 77		2,022 77
" lock.....			109 07	1,010 48	1,119 55
Generally .....	2,948 12		5,541 65		8,489 77
Totals, Quebec....	84,593 69	1,158,084 04	71,075 27	15,391 05	1,329,144 05
Ontario.					
Algoma Mills .....	2,216 00				2,216 00
Barrie.....		1,165 30			1,165 30
Big Bay, North Keppel wharf.....			467 94		467 94
Bayfield.....		366 55			366 55
Blind River, wharf.....		5,364 54			5,364 54
Bowmanville.....	1,648 25		4,009 05		5,657 30
Bronte .....		3,050 01			3,050 01
Bruce Mines.....	5,159 00		60 00		5,219 00
Burke's Falls.....		4,497 74			4,497 74
Burlington Channel.....			43,169 88	2,123 80	45,293 68
Calendar.....			1,459 47		1,459 47
Chantry Island .....			3,300 00		3,300 00
Cobourg.....	3,293 31		7,146 76		10,440 07
Collingwood.....	85,129 24				85,129 24
Cornwall.....			4,801 92		4,801 92
Depot Harbour, breakwater.....		30,919 89			30,919 89
Gananoque.....	3,326 35				3,326 35
Goderich.....	17,776 59		5,979 80		23,756 39
Haileybury, Lake Témiscamingue.....		3,573 98			3,573 98
Harwood Wharf, Rice Lake.....		999 40			999 40
Hawkesbury.....	6,495 82				6,495 82
Hawkestone .....			150 89		150 89
Hilton, St. Joseph's Island .....			1,499 81		1,499 81
Huntsville.....		3,396 03			3,396 03
Kincardine.....			4,036 71		4,036 71
Kingston, harbour.....	1,268 40				1,268 40
" graving dock.....			5 25	5,030 57	5,035 82
Kingsville.....	1,330 72	8,983 23			10,313 95
Lancaster.....			377 01		377 01
Meaford.....		25,157 12			25,157 12
Midland.....	23,759 44				23,759 44
Narrows between Lake Simcoe and Couchiching.....	4,043 50			20 00	4,063 50
Newcastle.....	478 00		5,000 00		5,478 00
New Liskeard, Lake Témiscamingue...	1,532 38				1,532 38
Carried forward. ....	157,457 00	87,473 79	81,464 49	7,174 37	333,569 65



## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>HARBOURS AND RIVERS—Con.</b>					
Brought forward.....	157,457 00	87,473 79	81,464 49	7,174 37	333,569 65
<i>Ontario—Con.</i>					
North Bay.....			14 00		14 00
Oakville.....			4,013 65		4,013 65
Orillia.....		3,076 33			3,076 33
Oshawa.....		1,268 20			1,268 20
Otonabee River.....	1,322 36				1,322 36
Owen Sound.....	18,528 27	400 00			18,928 27
Pelee Island.....		3,600 54			3,600 54
Penetanguishene.....	10,076 65				10,076 65
Pickering.....	1,838 08		1,260 08		3,098 16
Point Edward.....	6,966 34				6,966 34
Port Arthur.....	29,146 02				29,146 02
Port Burwell.....	1,725 25	38,428 06			40,153 31
Port Colborne.....		262,666 46			262,666 46
Port Elgin.....	1,456 48		4,999 98		6,456 46
Port Hope.....	2,086 17		5,017 45		7,103 62
Port Rowan.....			264 19		264 19
Portsmouth.....			516 50		516 50
Port Stanley.....			10,267 79		10,267 79
Presque Ile Wharf.....			144 23		144 23
Richards Landing.....			1,498 46		1,498 46
River St. Lawrence (dredging at Wolf Island).....	9,995 45				9,995 45
River Kaministiquia.....	59,704 91				59,704 91
Rondeau Harbour.....	3,007 62		6,937 13		9,944 75
River Thames.....	8,449 77				8,449 77
Sault St. Marie.....	11,643 23	3,764 75			15,407 98
Sheguindah.....			181 35		181 35
Scugog River.....	2,904 50				2,904 50
Southampton.....		17 75			17 75
South Nation River.....		1,002 80			1,002 80
St. Joseph, Lake Huron.....		5,042 39			5,042 39
Sturgeon Falls.....		506 54			506 54
Sydenham River.....			96 00		96 00
Summertown.....			96 08		96 08
Thessalon.....			659 80		659 80
Thornbury.....	6,130 00		507 93		6,637 93
Toronto.....	2,582 00	6,557 08			9,139 08
Trenton.....	240 00				240 00
Victoria Harbour.....	1,761 10				1,761 10
Wendover.....		3,083 17			3,083 17
Warton.....	1,290 00		698 49		1,988 49
Generally.....	4,076 77			10,130 02	14,206 79
<b>Totals, Ontario</b> .....	<b>342,387 97</b>	<b>416,887 86</b>	<b>118,637 60</b>	<b>17,304 39</b>	<b>895,217 82</b>
<i>Manitoba.</i>					
Gull Harbour.....		2,488 44			2,488 44
Gypsumville.....	1,212 57				1,212 57
Gimli.....			3,555 58		3,555 58
Hnausa.....		2,532 73			2,532 73
Lake Dauphin, lowering.....		470 46			470 46
Lake Frances, Outlet.....		6,496 91			6,496 91
Lake Manitoba (buoys).....		107 50			107 50
Red River—Mouth.....	11,971 03				11,971 03
Selkirk.....		4,391 13			4,391 13
St. Andrew's Rapids (Red River).....		62,852 84			62,852 84
White Mud River.....	3,336 63				3,336 63
Generally.....	5,019 87		2,700 32		7,720 19
<b>Totals, Manitoba</b> .....	<b>21,540 10</b>	<b>79,340 01</b>	<b>6,255 90</b>		<b>107,136 01</b>



PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS.					
British Columbia.					
Anderson Lake.....			1,486 80		1,486 80
Columbia River, above Revelstoke.....			4,901 91		4,901 91
"    "    Golden.....		7,490 54			7,490 54
"    below Golden.....		1,995 47			1,995 47
"    Upper and Lower Ar- row Lakes.....		11,306 30			11,306 30
Duncan River.....			1,993 56		1,993 56
Esquimalt, graving dock.....				15,179 20	15,179 20
Fraser River.....	30,397 49		4,913 29		35,310 78
Hardy Bay, wharf.....		2,458 00			2,458 00
Kennedy Lake.....			2,004 39		2,004 39
Nanaimo Harbour.....	12 00				12 00
Pender Island.....	3,590 75				3,590 75
Salmon River.....			2,578 76		2,578 76
Skeena River.....			7,410 79		7,410 79
Victoria Harbour.....	17,276 57				17,276 57
Williams Head, quarantine station.....			1,757 60		1,757 60
Generally.....				2,827 54	2,827 54
Totals, British Columbia.....	51,276 81	23,250 31	27,047 10	18,006 74	119,580 96
Yukon Territory.					
Lewes and Yukon Rivers.....		26,852 18			26,852 18
Totals, Yukon.....		26,852 18			26,852 18
Harbours and Rivers Generally.					
General expenses of staff, &c.....	4,901 51			9,914 51	14,816 02
Totals, Harbour and rivers generally...	4,901 51			9,914 51	14,816 02
DREDGES AND DREDGING PLANT.					
Maritime Provinces.....		184,615 82	a		184,615 82
Ontario and Quebec.....		173,066 41	16,535 89		189,602 30
Manitoba.....		3,931 33	12,053 99		15,985 32
British Columbia.....			4,997 43		4,997 43
Totals, dredges and dredging plant.....		361,613 56	33,587 31		395,200 87
SLIDES AND BOOMS.					
Richelieu River, Q.—					
Belœil booms.....			25 25	140 12	165 37
St. John's booms.....			8 73		8 73
Ottawa District.....				29,801 60	29,801 60
Ottawa River.....			5,205 32		5,205 32
Black River.....			142 95		142 95
Coulonge River.....			1,892 59		1,892 59
Dumoine River.....			1,005 79		1,005 79
Gatineau River.....		4,949 29	2,291 11		7,240 40
Madawaska River.....			1,384 47		1,384 47
Petewawa River.....			1,808 77		1,808 77
St. Maurice District.....		30,313 14	10,181 60	38,108 17	78,602 91
Trent and Newcastle District.....		303 27	2,188 15	2,058 60	4,550 02
Generally, including collection of tolls.....				3,815 70	3,815 70
Totals, slides and booms.....		35,565 70	26,134 73	73,924 19	135,624 62

(a) Cost of repair apportioned with dredging, see various harbours in Maritime Provinces.



## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—Continued

Name of Work.	Construc- tion and Improve- ment.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>ROADS AND BRIDGES.</b>				
<i>Quebec and Ontario.</i>				
Des Joachims Bridge, Ottawa River.....	1,358 77	.....	.....	1,358 77
Hull Bridge, Pond Creek.....	.....	1,130 52	.....	1,130 52
Ottawa, Maria St., (Laurier) Bridge.....	5,078 57	.....	.....	5,078 57
Ottawa City bridges and streets maintained by Govt.—				
Chaudière bridges and approaches.....	.....	1,178 78	.....	1,178 78
Sappers and Dufferin bridges and Wellington st. ....	.....	5,871 28	.....	5,871 28
Lighting all the above.....	.....	.....	1,847 50	1,847 50
Portage du Fort Bridge, Ottawa River.....	356 69	.....	.....	356 69
York Bridge, Grand River.....	.....	.....	16 00	16 00
<i>North-West Territories.</i>				
Battleford Bridge, Battle River.....	21,848 97	.....	.....	21,848 97
Edmonton Bridge, Saskatchewan River.....	.....	397 22	.....	397 22
Calgary Bridge, Bow River.....	.....	2 00	.....	2 00
Lethbridge Bridge, Belly River.....	.....	2,964 75	.....	2,964 75
Macleod Bridge, Old Man's River.....	.....	1,663 53	.....	1,663 53
Generally N. W. T.....	.....	.....	2,049 70	2,049 70
<i>Yukon District.</i>				
Yukon River Road.....	481 00	.....	.....	481 00
Totals, Roads and Bridges.....	29,124 00	13,208 08	3,913 20	46,245 28
<b>TELEGRAPH LINES.</b>				
<i>Newfoundland.</i>				
Cape Ray line (subsidy).....	.....	.....	500 00	500 00
<i>Nova Scotia.</i>				
Chéticamp line.....	.....	.....	2,654 44	2,654 44
Mabou to Port Hawkesbury.....	3,308 73	.....	.....	3,308 73
Meat Cove line.....	.....	.....	4,784 22	4,784 22
St. Peters to Louisbourg, Scatari and North Sydney.	6,639 65	.....	.....	6,639 65
"    Canso.....	4,982 60	.....	.....	4,982 60
<i>Prince Edward Island.</i>				
P. E. Island and mainland (subsidy) ..	.....	.....	1,946 66	1,946 66
<i>New Brunswick.</i>				
Bay of Fundy.....	.....	.....	2,749 07	2,749 07
Escuminac.....	.....	.....	634 80	634 80
<i>Quebec.</i>				
Anticosti-Gaspé line.....	.....	.....	4,394 76	4,394 76
Belle-Isle and Chateau Bay, Marconi system..	2,550 18	.....	.....	2,550 18
"    line.....	138 83	.....	.....	138 83
Bryon Island to Anticosti and Magdalen Islands....	71,477 24	.....	296 00	71,773 24
Chicoutimi to St. Charles and St. Ambroise.....	1,185 41	.....	.....	1,185 41
Father Point.....	.....	.....	500 00	500 00
Grosse Isle quarantine line ..	.....	.....	4,750 15	4,750 15
Isle aux Coudres line.....	.....	174 72	.....	174 72
Magdalen Islands lines.....	3,397 39	.....	4,628 82	8,026 21
Maritime Provinces and Gulf generally.....	.....	3,254 54	4,622 10	7,876 64
North Shore, west of Bersimis.....	.....	.....	6,027 42	6,027 42
"    east    "    .....	220 50	2,284 27	17,911 57	20,416 34
Carried forward... ..	93,900 53	5,713 53	56,400 01	156,014 07



PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
TELEGRAPH LINES—Con.	\$ cts.	\$ cts.	\$ cts.	\$ cts
Brought forward.....	93,900 53	5,713 53	56,400 01	156,014 07
Quebec—Con.				
Romaine to Belle-Isle .....	4,159 90	.....	.....	4,159 90
St. Anne du Saguenay to St. Charles... ..	1,462 10	.....	.....	1,462 10
Theodore Bouchard, allowance.....	.....	.....	346 45	346 45
Cablesnip 'Tyrian'.....	.....	.....	36,699 69	36,699 69
Ontario.				
Pelee Island line.....	.....	3,097 70	396 84	3,494 54
North-west Territories.				
St. Albert and Rivière qui Barre line .....	1,753 22	.....	.....	1,753 22
North-West lines generally.....	.....	.....	20,000 00	20,000 00
British Columbia and Yukon District.				
Alberni-Cape Beale.....	.....	.....	1,118 00	1,118 00
Alberni-Claoquot.....	6,463 49	.....	1,856 53	8,320 02
Ashcroft-Dawson.....	20,033 45	.....	281,608 28	301,641 73
Golden-Windermere.....	1,230 73	.....	2,589 32	3,820 05
150-Mile House-Quesnelle.....	5,105 94	.....	.....	5,105 94
Kamloops-Nicola Lake.....	.....	.....	684 05	684 05
Nanaimo-Comox.....	.....	.....	3,817 00	3,817 00
Port Simpson-Hazelton.....	1,044 97	.....	.....	1,044 97
Vancouver-Salt Spring Island.....	.....	.....	179 10	179 10
Victoria-Cape Beale.....	.....	2,381 96	4,607 21	6,989 17
British Columbia, generally.....	.....	.....	79 38	79 38
Telegraph service, generally.....	.....	.....	2,363 20	2,363 20
Totals, Telegraph Lines.....	135,154 33	11,193 19	412,745 06	559,092 58



## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>MISCELLANEOUS.</b>					
Surveys and inspections . . . . .				48,496 72	48,496 72
Temporary employes—					
Secretary and accountant's staff . . . . .				38,543 71	38,543 71
Chief architect's staff . . . . .				29,982 55	29,982 55
Chief engineer's staff . . . . .				69,063 24	69,063 24
Supt. tel. service staff. . . . .				4,000 00	4,000 00
Departmental photographer . . . . .				750 00	750 00
Technical and other books of reference . . . . .				559 89	559 89
Vaillancourt, F.—gratuity . . . . .				32 50	32 50
Public Works agency, B.C. . . . .				1,193 57	1,193 57
Totals, miscellaneous. . . . .				192,622 18	192,622 18

## RECAPITULATION.

<b>Totals, Public Buildings—</b>					
Nova Scotia . . . . .		83,351 19	11,910 92	30,577 02	125,839 13
Prince Edward Island . . . . .			1,235 33	6,330 94	7,566 27
New Brunswick . . . . .		30,900 68	7,620 51	24,100 13	62,621 32
Maritime Provinces generally . . . . .				980 08	980 08
Quebec . . . . .		102,626 72	42,646 53	83,286 61	228,559 86
Ontario . . . . .		292,573 87	237,826 61	278,850 62	809,251 10
Manitoba . . . . .		12,211 51	10,182 52	20,055 01	42,449 04
North-west Territories . . . . .		39,823 32	9,059 51	18,365 86	67,248 69
British Columbia . . . . .		71,822 99	26,725 49	24,410 04	122,958 52
Yukon Territory . . . . .		8,999 04		44,453 27	53,452 31
Public Buildings generally . . . . .				18,079 28	18,079 28
<b>Totals, Harbours and Rivers—</b>					
Nova Scotia . . . . .	31,753 31	128,980 34	42,471 96	13,480 22	216,685 83
Prince Edward Island . . . . .	14,541 49	34,359 28	13,213 95	1,075 85	63,190 57
New Brunswick . . . . .	36,195 40	116,809 02	33,618 91	3,480 21	190,103 54
Quebec . . . . .	84,593 69	1,157,984 04	71,075 27	15,491 05	1,329,144 05
Ontario . . . . .	342,387 97	416,887 86	118,637 60	17,304 39	895,217 82
Manitoba . . . . .	21,540 10	79,340 01	6,255 90		107,136 01
British Columbia . . . . .	51,276 81	23,250 31	27,047 10	18,006 74	119,580 96
Yukon District . . . . .		26,852 18			26,852 18
Harbours and Rivers generally . . . . .	4,901 51			9,914 51	14,816 02
<b>Totals, dredges and dredging plant. . . . .</b>		361,613 56	33,587 31		395,200 87
" slides and booms . . . . .		35,565 70	26,134 73	73,924 19	135,624 62
" roads and bridges . . . . .		29,124 00	13,208 08	3,913 20	46,245 28
" telegraph lines . . . . .		135,154 33	11,193 19	412,745 06	559,092 58
" Miscellaneous . . . . .				192,622 18	192,622 18
<b>Grand totals of expenditure..</b>	<b>587,190 28</b>	<b>3,188,229 95</b>	<b>743,651 42</b>	<b>1,311,446 46</b>	<b>5,830,518 11</b>



3-4 EDWARD VII., A. 1904

PART II.—STATEMENT B.—Showing the cost of the following services for each Public Building, &c. ; (the total for each province being carried into Statement “A.”)

Name of Building.	Rents.	Salaries of Engineer , &c.	Heating.	Lighting.	Water.	Total.
<i>Nova Scotia.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Amherst post Office.....		466 70	187 50	291 60	30 00	975 80
Annapolis ".....		488 65	175 46	183 75	40 00	887 86
Antigonish ".....		469 00	98 84	50 60	10 00	628 44
Arichat " &c.....			245 00			245 00
Baddeck ".....		306 67	129 75	21 50		457 92
Dartmouth " &c.....		291 70	87 56	169 77	20 70	569 73
Digby " &c.....		479 22	213 75	398 56	60 00	1,151 53
Halifax, Asst. Receiver General's office.	1,517 40		50 40	66 20		1,634 00
" Dominion Building.....		3,007 90	1,099 05	2,284 80	500 00	6,891 75
" Drill Shed.....		1,090 57				1,090 57
" Examining Warehouse.....	1,250 00	466 70	9 10	53 40		1,779 20
" Immigrant Shed.....		700 00	11 60	411 94	1,108 41	2,231 95
" Engineer's Office.....	449 50					449 50
Kentville Post Office &c.....		470 80	335 54	260 00	50 00	1,116 34
Liverpool ".....		472 28	211 95	141 01	18 00	843 24
Lunenburg.....		364 69	252 69	111 80	44 25	773 43
New Glasgow Post Office &c.....		365 48	184 50	448 88	100 00	1,098 86
North Sydney ".....		475 13	165 90	188 53	22 00	841 56
Pictou, Custom House.....		6 50	52 20	5 50	54 17	118 37
" Post Office.....		541 98	217 81	218 75	77 83	1,056 37
Springhill Post Office &c.....		495 48	300 90	233 53	60 00	1,089 91
Sydney ".....		478 29	124 00	743 53	70 00	1,415 82
Truro ".....		417 37	204 61	310 48	60 00	992 46
Windsor ".....		477 83	340 43	251 00	25 00	1,094 26
Yarmouth ".....		477 93	14 00	322 60	72 00	886 53
Totals, Nova Scotia, carried to Statement A, page 3.....	3,216 90	12,810 87	4,712 54	7,157 73	2,422 36	30,320 40
<i>Prince Edward Island.</i>						
Charlottetown Dominion Building.....		2,451 61	555 69	1,078 92	168 75	4,254 97
" Engineer's Office.....	290 00					290 00
Montague Post Office.....		198 57	67 80	18 75		285 12
Summerside ".....		510 99	331 98	157 88		1,000 85
Totals, Prince Edward, Island, car- ried to Statement A, page 3.....	290 00	3,161 17	955 47	1,255 55	168 75	5,830 94
<i>New Brunswick.</i>						
Bathurst P. B.....		573 59	259 42	24 00		857 01
Carleton, St. John, Post Office, &c.....		116 70	193 89	162 95	8 50	482 04
Chatham Post Office, &c.....		379 76	362 83	124 20	14 25	881 04
Dalhousie ".....		469 40	146 48	9 60		625 48
Fredericton P. B.....		483 19	120 26	578 97	51 00	1,233 42
Moncton P. B.....		485 70	283 85	342 40	134 00	1,245 95
Newcastle P. B.....		492 74	242 98	193 20		928 92
Portland P. B.....			55 34		13 50	68 84
St. John Custom House.....		2,247 90	2,166 75	528 09	572 28	5,515 02
" Post Office.....	175 95	1,606 00	1,021 91	2,612 80	757 67	6,174 33
" Savings Bank.....	44 00	4 45	396 66	129 63	18 70	593 44
Tracadie Lazaretto.....		187 50	755 00			942 50
St. John Immgt. Bldg.....		618 01	539 69	597 47	59 60	1,814 77
St. Stephen's Post Office, &c.....		479 49	120 28	412 50	64 00	1,076 27
Sussex Post Office, &c.....		239 37	126 65	143 61		509 63
" Armoury.....			65 50			65 50
Woodstock Post Office, &c.....		499 20	218 35	161 25	34 00	912 80
Totals, New Brunswick, carried to Statement A, page 4.....	219 95	8,883 00	7,075 84	6,020 67	1,727 50	23,926 96
<i>Quebec.</i>						
Aylmer post office.....		70 00	242 00	155 50	33 00	500 50
Berthierville post office.....		10 79	193 45	30 36	34 34	268 94
Buckingham public building.....		179 90	101 00	127 48	65 10	473 48
Carried forward.....		260 69	536 45	313 34	132 4	1,242 92



## SESSIONAL PAPER No. 19

PART II.—STATEMENT B.—Showing the cost of the following services for each Public Building, &c.—*Continued.*

Name of Building.	Rents.	Salaries of Engineers, &c.	Heating.	Lighting.	Water.	Total.
<i>Quebec—Concluded.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....		260 69	536 45	313 34	132 44	1,242 92
Chicoutimi engineers office.....	25 00					25 00
Coaticook public building.....		494 00	204 51	326 70	40 00	1,065 21
Drummondville public building.....		116 51	142 62	33 62	8 76	301 51
Granby public building.....		32 25	63 50	7 89		103 64
Grosse Isle quarantine station.....				251 40		251 40
Fraserville public building.....		362 05	127 50	38 01	60 00	587 56
Hochelaga post office.....		277 34	260 93	93 09	60 62	691 98
Hull post office.....		177 00	279 70	667 73	156 52	1,280 95
Joliette post office.....		478 42	216 23	98 55	108 00	901 20
Lachine post office.....		134 60	54 00	70 20	29 52	288 32
Laprairie post office.....		69 40	167 02	36 44	40 00	312 86
Montmagny post office.....		14 58	42 35	35 93	27 00	119 86
Montreal Civil Service exam. office.....	158 50					158 50
" custom house.....		2,415 52	1,363 61	517 37	323 13	4,619 63
" dominion public building.....		1,741 67				1,741 67
" drill hall.....		765 00				765 00
" examining warehouse.....		2,503 94	3,332 32	926 28	531 61	7,294 15
" immigration building.....	500 00					500 00
" inland rev nue office.....		701 07	431 73	206 64	103 91	1,443 35
" post office.....	454 67	14,779 56	1,312 68	7,893 23	913 86	25,354 00
" engineers office.....	262 50				30 07	292 57
" P. O. Windsor st.....	650 00					650 00
Quebec citadel buildings.....	32 50	568 57	528 05	11 13		1,140 25
" clerk of works office, P. O.....	40 00	87 00				127 00
" " residence.....	25 00					25 00
" culler's office.....		631 50	223 18			854 68
" custom house.....		694 87	1,269 21	876 89	815 90	3,656 87
" examining warehouse.....		1,844 67	769 25	206 51	458 48	3,278 91
" immigration office.....		150 65	749 88	704 40		1,604 93
" observatory.....					50 00	50 00
" post office building.....		1,883 22	1,121 99	976 75	764 31	4,746 27
" Queen's wharf building.....			497 33	51 80	764 31	1,313 44
" St. Rock P.O.....			40 89	41 67		82 56
" engineer's office.....	198 00					198 00
Peribonka immigrant shed.....		350 00	93 75			443 75
Richmond public building.....		339 98	371 90	195 90	25 00	932 78
Rimouski ".....		187 50	130 50	39 20		357 20
Roberval immigration shed.....		350 00	125 25	36 22	33 75	545 22
" engineer's office.....	16 67					16 67
Sherbrooke P. B.....		519 60	480 61	792 57	43 75	1,836 53
Sorel P. B.....		566 51	120 60	364 50	250 00	1,301 61
St. Henri P. O.....			21 00	78 04	36 60	155 64
St. Hyacinthe P. B.....		496 72	414 90	401 65	71 00	1,388 27
St. Jérôme P. B.....		482 90	209 95	191 37	25 00	909 22
St. John's P. B.....		408 40	81 03	250 00		739 43
Three Rivers custom house.....		361 56	212 92	57 71	48 00	680 19
" post office.....		504 15	461 94	88 62	62 00	1,116 71
Valleyfield P. B.....	150 00	1 50	77 00	68 90	37 09	334 49
Victoriaville ".....	2 00	93 00	264 13	116 08	50 02	525 23
West Farnham post office.....		5 75	84 80	69 98	10 00	170 53
Total for Quebec, carried to Statement A, page 5.....	2,514 84	35,851 65	16,885 21	17,156 31	6,114 65	78,522 66
<i>Ontario.</i>						
Almonte post office, &c.....		477 25	137 12	111 33	77 00	802 70
Amherstburg post office, &c.....		502 88	57 65	210 45	26 25	797 23
Arnprior P. B.....		479 30	60 00	165 49	57 80	762 59
Barrie ".....		474 70	5 00	159 96	50 00	689 66
Belleville ".....		791 93	538 03	700 35	85 50	2,115 81
Berlin ".....		508 50	267 76	432 03	15 83	1,224 12
Carried forward.....		3,234 56	1,065 56	1,779 61	312 38	6,392 11



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PART II.—STATEMENT B.—Showing the cost of the following services for each Public Building, &c.—*Continued.*

Name of Building.	Rents.	Salaries of Engineers, &c.	Heating.	Lighting.	Water.	Total.
<i>Ontario—Con.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....		3,234 56	1,065 56	1,779 61	312 38	6,392 11
Brampton P. B.....		492 50	92 55	320 89	31 50	937 44
Brantford ".....		716 14	414 63	414 96	38 00	1,583 73
Brockville ".....		481 20	349 10	735 25	170 00	1,735 55
Carleton Place P. B.....		362 18		38 10		400 28
Cayuga P. O.....		62 10	92 10	7 35		161 55
Chatham, P. B.....		555 97	175 83	336 28	42 50	1,110 58
Cobourg post office, &c.....		477 55	222 25	394 51	53 07	1,147 38
Cornwall P. B.....		549 94	382 00	692 83	56 25	1,681 02
Deseronto ".....		2 20		0 25		2 45
Dundas post office.....	625 00	58 40		65 00		748 40
Galt P. B.....		502 36	232 20	310 86	32 50	1,077 92
Gananoque custom house.....			192 90	94 00		286 90
" post office.....		2 00	144 65	141 00	5 00	292 65
Goderich public building.....		467 70	41 69	70 80	60 00	640 19
Guelph ".....	12 50	489 50	195 28	332 64	37 44	1,067 36
Hamilton custom house.....		700 00	32 00	76 27	35 70	843 97
" drill shed.....		495 00				495 00
" post office.....		1,552 07		2,080 71	1,010 95	4,643 73
Ingersoll public building.....		530 06	49 02	340 13	32 55	951 76
Kingston custom house.....		230 20	317 40	141 30	73 60	762 50
" exam. warehouse.....			41 40		0 55	41 95
" inland revenue office.....				306 98	81 37	388 35
" military college.....		2,945 00		314 00		3,259 00
" post office.....		175 25	314 50	1,096 01	48 06	1,633 82
Lindsay post office.....		466 70	166 35	93 75	30 00	756 80
London custom house.....		1,272 57	765 52	756 66	140 00	2,934 75
" post office.....		728 88	787 10	847 67	60 00	2,423 65
Napanee ".....		524 80	250 00	60 10	69 44	904 34
Niagara Falls public building.....		497 15	216 23	327 00	45 00	1,085 38
Orangeville post office.....		474 43	200 63	80 65	15 00	770 71
Orillia ".....		358 25	194 40	90 27	32 50	675 42
Ottawa, experimental farm.....			1,610 82	55 47		1,666 29
" geological museum.....		648 00	1,433 68	273 90		2,355 58
" Major's Hill green-house.....		288 00	322 50			610 50
" military stores.....			374 50			374 50
" national art gallery.....		130 00	234 00	40 00		404 00
" parliamentary and departmen- tal buildings.....		32,561 94	34,951 38	18,850 82		86,363 14
" post office.....		1,273 50	784 00	1,112 10		3,169 60
" printing bureau.....		6,447 79	8,244 52	564 90		15,257 21
" supreme court.....		1,572 00	669 53	334 00		2,575 53
" rideau hall guard-room.....			46 00			46 00
Ottawa, rented buildings—						
Census building.....	8,125 00	2,306 00	586 95	225 00		11,242 95
Customs statistical office.....	1,875 00	288 00	361 20	206 00		2,730 20
" exam. warehouse.....	1,700 00	576 00	260 00			2,536 00
Dairy commissioner's office.....	1,433 33		260 00			1,693 33
French translators' office.....	525 00		72 75	90 50		688 25
Geological, museum annex.....	750 00					750 00
Immigration com'r's office.....	2,250 00			173 76		2,423 76
Interior dept. (Slater chambers).....	525 00					525 00
Labour dept.....	1,200 00			96 50		1,296 50
Langevin block, Howell and Perley claims.....	15 00					15 00
Marine stores.....	240 00		193 50			433 50
Model-room.....	562 50					562 50
N. W. M. Police stores.....	1,425 00		167 70	83 00		1,675 70
Observatory.....				72 00		72 00
Post office dept. (Slater chambers).....	675 00					675 00
Public works (Slater chambers).....	630 00					630 00
" workshops and yard.....	2,200 00	912 00	451 50	691 50		4,255 00
Surveyor General's offices.....	4,500 00	288 00	313 54	240 00		5,341 54
Carried forward.....	29,268 33	66,695 89	58,273 36	35,455 28	2,513 36	192,206 22



## SESSIONAL PAPER No. 19

PART II.—STATEMENT B.—Showing the cost of the following services for each Public Building, &c.—*Continued*

Name of Building.	Rents.	Salaries of Engineers, &c.	Heating.	Lighting.	Water.	Total.
<i>Ontario—Con.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward. ....	29,268 33	66,695 89	58,273 36	35,455 28	2,513 36	192,206 22
Paris P. B. ....		404 13	10 00	176 46	63 60	654 19
Pembroke post office. ....		479 20	213 95	148 50	28 00	869 65
Peterboro' custom house. ....		356 80	281 73	188 18	50 00	876 71
" post office. ....		358 00	229 13	537 50	75 00	1,199 63
Petrolea " ....		485 60	46 68	25 51	22 32	580 11
Picton " ....		426 90	214 50	159 25	25 59	826 24
Port Arthur " ....		362 25	203 00	96 15		661 40
Port Colborne " ....		309 55		156 25	10 00	475 80
Port Hope " ....		480 50	242 05	386 20	8 79	1,117 54
Prescott post office. ....		484 74	48 00	125 00	120 00	777 74
Rat Portage P. B. ....		483 05	715 38	218 95	70 76	1,488 14
Sarnia P. B. ....			7 00			7 00
Smith's Falls post office. ....		358 40	167 50	166 31	91 90	784 11
Stratford P. B. ....		762 50	374 87	317 83	84 08	1,539 28
Strathroy P. B. ....		495 95		236 89	2 70	735 54
St. Catharines P. B. ....		477 40	93 35	324 05	57 00	951 80
St. Thomas P. B. ....		495 00	283 50	914 05	53 77	1,746 32
" armoury. ....		70 00				70 00
Toronto civil service exam. office. ....	46 00					46 00
" custom house. ....		1,631 34	408 30	294 21	56 28	2,390 13
" Dominion P. B. ....		1,400 00				1,400 00
" drill shed. ....		1,305 82				1,305 82
" examining warehouse. ....		5,323 17	1,059 89	205 39	69 83	6,658 28
" P. O. for P. M. ....	120 00					120 00
" inland revenue office. ....		781 75	164 43	198 20	21 40	1,165 78
" steamboat inspector's office. ....	562 50					562 50
" post office. ....		2,081 97	1,383 93	3,428 30	324 67	7,218 87
" " stable. ....	180 00					180 00
" union station. ....	875 00	700 75		1,600 08	4 00	3,179 83
" receiver general. ....		522 50		128 58		651 08
" engineer's office. ....	668 00			12 00		680 00
Trenton post office. ....		571 40	142 06	257 50	75 00	1,045 96
Walkerton " ....		469 88	190 89	259 40	31 00	951 17
Windsor P. B. ....		926 20	448 75	906 98	96 00	2,377 93
" armoury. ....		350 00				350 00
Woodstock P. B. ....		516 10	320 42	342 08	44 00	1,222 60
Total for Ontario, carried to Statement A, page 7. ....	31,719 83	90,566 74	65,522 67	47,265 08	3,999 05	239,073 37
<i>Manitoba.</i>						
Brandon Dominion lands office. ....		700 00			75 00	775 00
" experimental farm. ....			257 61			257 61
" immigrant building. ....			80 20			80 20
" post office &c. ....		34 80	769 40	718 74		1,522 94
East Selkirk, immigrant shed. ....	10 00		488 50			498 50
Minnedosa Dominion lands office. ....			149 45			149 45
Portage LaPrairie, post office. ....		466 70	547 58	262 20		1,276 48
Winnipeg, Crown timber. ....		108 50				108 50
" custom house. ....		416 60	827 28	171 36	71 76	1,487 00
" Dominion lands office. ....			267 25	17 15	31 43	315 83
" engineer's office. ....	379 75					379 75
" examining warehouse. ....			395 22	52 82	21 27	469 31
" immigrant shed. ....			1,342 17	596 50	594 92	2,533 59
" post office. ....	50 00	3,141 32	2,491 15	3,269 58	660 58	9,612 63
" weight and measure. ....	120 00					120 00
Total for Manitoba, carried to Statement A, page 7. ....	559 75	4,867 92	7,615 81	5,088 35	1,454 96	19,586 79



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PART II.—STATEMENT B.—Showing the cost of the following services for each Public Building, &c.—Continued.

Name of Building.	Rents.	Salaries of Engineers, &c.	Heating	Lighting.	Water.	Total.
<i>North-west Territories.</i>	\$ cts.	\$ cts.	\$ cts	\$ cts.	\$ cts.	\$ cts.
Alameda, Dominion lands .....	195 00		56 87			251 87
Calgary, court house, &c.....		726 93	422 93	159 25	330 00	1,639 11
" engineer's office.....	40 00					40 00
" immigrant building.....			155 79			155 79
" land and registry office.....		9 25	43 64	6 80		59 69
" post office .....		607 50	257 16	535 90	340 00	1,740 56
Carnduff court house.. ..			7 05			7 05
Dauphin, immigrant shed ...			41 00			41 00
Edmonton, court-house.....	150 00		7 20	1 98		159 18
" Dom. lands & registry office..		472 00	250 50	4 60		727 10
" immigrant shed .....	700 00		207 71			907 71
" post office.....	45 00	6 10	5 00	122 90		179 00
Indian Head, experimental farm.....			12 00			12 00
Lacombe, immigrant building.....	253 00		52 50			305 50
Leduc " " .....	60 00					60 00
Lethbridge court house & custom house ..		7 90				7 90
" immigration building.....			39 00			39 00
" post office .. ..	36 00	534 00	157 50	140 18	42 00	909 68
Medecine Hat, court house.....		652 30	93 61	58 63	15 00	819 54
Macleod, custom house.....		204 20	119 94			324 14
" court-house.....	375 00		56 96			431 96
" immigrant hall.....	140 00		42 40			182 40
Moose Jaw, court-house .. ..		466 70	133 75		1 00	601 45
Moosomin " .....		706 65	386 84	13 61		1,107 10
Ponoka, immigrant building.....	96 00					96 00
Prince Albert, Dom. lands & reg. office	30 50	480 60		10 50		521 60
" immigrant shed.. ..			215 60			215 60
Qu'Appelle, court house .. ..		45 00				45 00
Red Deer, Dominion lands office.....	120 00		77 00			197 00
" immigrant shed.....	300 00					300 00
Regina, court house.....		1,247 76	563 75	213 53		2,025 04
" Dominion lands & regis. office..		648 75	485 25	367 80		1,501 80
" immigrant building .....			214 25	1 60		215 85
" post office.....		5 90	282 25	10 85		299 00
Northern, immigrant shed.....			45 25			45 25
" Dominion lands.....	65 00					65 00
Saskatoon immigrant shed.....			151 87			151 87
Strathcona immigrant shed.....	180 00		97 15			277 15
Wetaskinwin immigrant shed.....	200 00		22 50			222 50
" court house .. ..	15 00					15 00
Wolsley court house. . . .		18 95	187 72			206 67
" lands office.....		630 00				630 00
Yorkton Dominion lands office .....	390 00					390 00
" immigrant building.....			16 00			16 00
Total, North-west Territories, carried to Statement A, page 8.....	3,390 50	7,470 49	4,907 94	1,648 13	728 00	18,145 06
<i>British Columbia.</i>						
Agassiz experimental farm.....			73 40			73 40
Atlin post office.....		177 25	90 00	46 60		313 85
Esquimalt custom house.....			13 10			13 10
Kamloops P. B. ....		753 00		220 77	36 00	1,009 77
" Dominion lands office.....			259 25			259 25
Kaslo drill hall.....			4 00			4 00
Nanaimo post office .....		713 85	70 00	287 60	36 00	1,107 45
Nelson public building.....		150 00	70 25			220 25
New Westminster drill shed.....			205 41			205 41
" engineer's office .....	203 00			1 00		204 00
" post office.....		772 55	582 34	510 62	57 27	1,922 78
Carried forward.....	203 00	2,566 65	1,367 75	1,066 59	129 27	5,333 26



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PART II.—STATEMENT B.—Showing the cost of the following services for each Public Building, &c.—*Concluded.*

Name of Building.	Rents.	Salaries. of Engineers, &c.	Heating.	Lighting.	Water.	Total.
<i>British Columbia—Con.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....	203 00	2,566 65	1,367 75	1,066 59	129 27	5,333 26
Rossland public building.....			83 59		48 00	131 59
Vancouver drill hall.....		3 00	290 64			293 64
" examining warehouse.....	1,560 00					1,560 00
" post office.....	837 50	1,456 53	544 64	1,594 12	52 90	4,485 69
Victoria, old custom house.....		710 75	167 60	57 76	17 00	953 11
" barracks.....			133 63			133 63
" drill hall.....			107 19			107 19
" indian office.....				12 30		12 30
" military store.....			165 78			165 78
" post office.....	42 00	3,273 15	1,028 65	1,728 44	59 60	6,131 84
" old post office.....					80 10	80 10
William's Head quarantine station....	30 00		3,215 94			3,245 94
Total, British Columbia, carried to Statement A, page 8....	2,672 50	8,010 08	7,105 41	4,459 21	386 87	22,634 07
<i>Dominion buildings generally</i> .....		15 20	1,094 73			1,109 93



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STATEMENT C.—Showing amounts loaned by Government under the authority of special Acts of Parliament and upon the recommendation of the Hon. the Minister of Public Works, during the Fiscal Year 1902-3.

To Whom Loaned.	Parliamentary Authority.	Purpose.	Amount.
Harbour Commissioners of Montreal.	Acts 59 Vict., ch. 10 and 61 Vict., ch. 47.	General works of improvement to harbour.	\$600,000 00
Harbour Commissioners of Montreal.	Act 1, Ed. VII., ch. 9.	Construction of a steel grain elevator.	300,000 00
	Total .....	.....	\$900,000 00

DEPARTMENT OF PUBLIC WORKS,  
ACCOUNTANT'S OFFICE,  
OTTAWA, Jan. 23, 1904.

A. G. KINGSTON,  
*Accountant.*



PART III.  
REPORT  
ON  
PUBLIC BUILDINGS THROUGHOUT THE DOMINION  
FOR THE FISCAL YEAR ENDED JUNE 30, 1903  
BY THE  
CHIEF ARCHITECT







PUBLIC WORKS, CANADA,  
CHIEF ARCHITECT'S OFFICE,  
OTTAWA, November 23, 1903.

FRED. GÉLINAS, Esq.,  
Secretary,  
Department of Public Works.

SIR,—I beg to submit, herewith, my official report on Dominion public buildings for the fiscal year ended June 30, 1903.

I have the honour to be, sir,  
Your obedient servant,  
D. EWART,  
*Chief Architect.*

## PROVINCE OF PRINCE EDWARD ISLAND.

### CHARLOTTETOWN.

#### PUBLIC BUILDING.

Further levelling and planting of grounds were carried out and repairs effected to furnaces, P. O. boxes, plastering, glazing, painting, woodwork, &c.

#### QUARANTINE STATION.

The exterior woodwork of the building was largely renovated, the roof shingled, the building painted throughout and general repairs effected.

### SUMMERSIDE.

#### PUBLIC BUILDING.

Additions were made to the electric lighting, and minor repairs to building and heating apparatus were effected.

## PROVINCE OF NOVA SCOTIA.

### ANNAPOLIS.

#### PUBLIC BUILDING.

An asphalt sidewalk with granite curb was laid along the street line of the government property, under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

### ARICHAT.

#### PUBLIC BUILDING.

On May 13, 1902, a contract was entered into for the construction of this building on the government property in the town of Arichat, between the Highway and the har-



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hour, westward of the old post office. It is a wooden 2½-story building on a cement concrete basement, 40 feet by 30 feet, to contain in the basement a bonded warehouse 19 feet square and two rooms for furnace and fuel; on the ground floor the post office and the telegraph office; on the first floor the customs' long room, collector's room and clerks' office, and in the attic 4 rooms for the caretaker.

Plans, &c., prepared and work supervised by this department.

Clerk of works—Wm. Maloney.

Contractor for construction of building—Edward Doyle.

Contractor for heating system—Frank Powers.

## BADDECK.

### PUBLIC BUILDING.

Repairs were made to plumbing, drainage and chimney, and the stonework outside was pointed. Work supervised by C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## DIGBY.

### PUBLIC BUILDING.

Some furniture for the Customs was supplied under the supervision of C. E. W. Dódwel, resident engineer and superintendent of buildings, Nova Scotia, Halifax.

## GUYSBOROUGH.

### PUBLIC BUILDING.

On April 14, 1902, a contract was entered into for the construction of this building on the corner of Upper Water and Prince streets. It consists of a main 2½-story block of brick on a stone basement 26 feet by 32 feet, including a 4-story engaged tower 11 feet square on the N.E. corner, together with a 1-story brick adjunct on a stone foundation 33 feet by 22 feet. The entire basement, excepting underneath the tower, is excavated and is for furnace-room, fuel and stores; the ground floor of the main building is for the post office, stairway-hall and wash-room, and the adjunct will contain the examining warehouse, customs and inland revenue offices; on the first floor are 6 offices, and in the attic the caretaker's apartments. In the yard is a well, also a detached wooden building on a stone foundation 15 feet by 10 feet, for a W.C.

Plans, &c., prepared and work supervised by this department.

Clerk of works—James Hall.

Contractor—E. T. Munro.

## HALIFAX.

### CUSTOM HOUSE.

This building, which was described in my last report, has been carried on continuously, and is now in progress.

### DOMINION BUILDING.

Extensive repairs were effected to woodwork, floors, ceilings, plumbing, heating, &c.; the lobbies and halls were painted and some carpets and furniture supplied.

The building was decorated on the occasion of the coronation of His Majesty the King.



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Work supervised by C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## DRILL HALL.

The main doors were re-varnished and the electric wiring repaired under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## EXAMINING WAREHOUSE.

Repairs were made to woodwork, ceilings, chimney, plumbing, heating and goods-hoist, under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## IMMIGRATION BUILDING.

Extensive repairs were made to plumbing, heating and plastering; the interior was painted throughout; a partition fence was put up in the main hall, and some hose and furniture supplied.

Work supervised by C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## LAWLOR'S ISLAND, QUARANTINE STATION,

Extensive repairs, renewals and additions were made to plumbing of first class detention building, the bacteriological laboratory was painted, and the woodwork of the buildings repaired generally.

Work supervised by C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## KENTVILLE.

## PUBLIC BUILDING.

The brickwork of the street gable was treated with stone liquid to arrest scaling.

Work done under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## MIDDLETON.

## ARMOURY.

This building, which was described in my last report, is completed and fitted up with a hot water heating system.

Plans, &c., prepared by this department.

Clerk of works—L. P. Young.

Contractors for construction and fittings—Allen, Son and Neily.

Contractors for heating—Crowe Brothers.

## SIDNEY (C.B.), QUARANTINE—POINT EDWARD.

A shelter building was erected for the steam disinfecting apparatus, under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.



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## SPRINGHILL.

## PUBLIC BUILDING.

Water service and plumbing were installed, and a cesspool to receive drainage was built in yard.

## PROVINCE OF NEW BRUNSWICK.

## CARLETON (ST. JOHN WEST).

## POST OFFICE.

The rear extension of the building, having settled through decay of the supporting piles, was jacked up and underpinned with a concrete and steel foundation wall; sundry repairs were made to woodwork, plumbing, vault doors, painting, stoves, &c.

All the foregoing supervised by D. H. Waterbury, of this department, St. John, N.B.

## FREDERICTON.

## PUBLIC BUILDING.

The back porch, being dilapidated, was removed and replaced by one of brick on a stone foundation, and having a metal covered roof. The water closet in basement was removed and replaced by a new flushometer closet. A special 2-inch water service main for fire purposes was laid from the street main into and up through building to roof, with hydrant valves and hose on each flat. The interior woodwork was painted, and the walls and ceilings, and a portion of the basement whitened. Some new gas lights were put in, and repairs were made to stonework, doors, sashes, locks and ventilators.

Work supervised by D. H. Waterbury, of this department, St. John, N.B.

## MARYSVILLE.

## PUBLIC BUILDING.

This building, which was described in my last report, is completed and fitted up with a hot water heating system.

Post office fittings, furniture, &c., are being supplied.

Plans, &c., prepared by this department.

Clerk of works—H. M. Clarke.

Contractor—C. J. B. Simmons.

## PARTRIDGE ISLAND (ST. JOHN).

## QUARANTINE STATION.

A temporary connection from steam pump was laid to detention buildings to supply salt water for flushing purposes. Plans are prepared for a fresh water supply from the city of St. John water service mains. At the quarantine steward's house, a new room was added to the extension, a chimney built, some new floors laid, a front stoop with steps and a rear platform built, some new doors hung, the foundation repaired and pointed, the woodwork of house painted and some roofing, plastering, glazing and general repairs effected. Under building C, the cellar was enlarged and an additional



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window put in. In buildings B and C some of the ships' berths were removed and replaced by 'Ives' iron beds. The grounds about the detention buildings were graded.

Works supervised by D. H. Waterbury, of this department, St. John, N.B.

## PORTLAND (ST. JOHN NORTH).

## POST OFFICE.

New plumbing, including an enamelled sink, fitted up in tenants' quarters, new cornices were run and repairs were made to the woodwork and painting.

All under the supervision of D. H. Waterbury, of this department, St. John, N.B.

## RICHIBUCTO.

## PUBLIC BUILDING.

On November 25, 1902, a contract was entered into for the construction of this building on a plot of ground on the east side of Water street, facing the harbour, and near the intersection of Court street. It consists of a 2½-story main building of brick, with stone dressings, 29 feet by 38 feet, on a stone foundation, and having a 1-story and basement adjunct 23 feet by 25 feet, of similar materials. The floors, partitions, stairs and roofs are wood, the roof covering of metal, excepting the deck roof covering, which is tar and gravel, and the floor of basement, which is concrete. The basement is to contain the heating apparatus and fuel; the ground floor, the post office in the main portion and the examining warehouse and closets in the adjunct; the first floor, the customs offices, and the attic the caretaker's apartments.

Plans, &c., prepared by this department.

Clerk of works—Cyrille Cômeau.

Contractor—James Reid.

## ST. JOHN.

## CUSTOM HOUSE.

A hardwood floor was laid in tank-room and the brick walls sheathed with wood. The north wing copper roof covering was repaired, and the entire copper roof covering, with the flag masts, were painted three coats. The metal screen of cashier's office in long room was painted; an additional telephone closet was built in the long room, and a flag closet in the dome. Shelving was put in the office of the Department of Public Works; articles of furniture, carpets, &c., were supplied to the offices of the Inspector of Lights, the Collector of Inland Revenue, the Inspector of Hulls and the Gas Inspector. Repairs were made to the asphalt floor and stone door sill of furnace-room, to the electric bells, plumbing, door locks, furniture, &c. An oak chromograph case was supplied for the meteorological service.

All under the supervision of D. H. Waterbury, of this department, St. John, N.B.

## IMMIGRATION BUILDING.

This building was completed, furnished and occupied.

## POST OFFICE.

A zinc-lined newspaper chute, reaching from lobby mailing slide to lower basement, and a zinc-lined receiving case were put in. Hardwood floors were laid in letter carriers' flat and lower basement rooms and halls. The basement walls and ceilings were limewashed and the woodwork painted. Window blinds were supplied to a number of offices; some condemned fire hose was replaced with new; an electric clock was



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supplied in general delivery room; the lobby was tinted and painted; new bulletin boards were provided; the sorting tables were covered with zinc; improvements were made to electric lighting; a closet and bag rack were supplied for the Inspector's flat, and repairs were made to plumbing, elevators, electric bells, speaking tubes, iron shutters, vault and door locks, fittings, furniture, glazing and woodwork.

All under the supervision of D. H. Waterbury, of this department, St. John, N.B.

#### SAVINGS BANK.

The flag mast, being decayed, was removed and a new one substituted; the brick setting of furnace was repaired and in part renovated; some new tubes were put in furnace, and some repairs were made to windows. All under the supervision of D. H. Waterbury, of this department, St. John, N.B.

#### WOODSTOCK.

##### PUBLIC BUILDING.

The original wooden retaining wall was removed and a new retaining wall of rubble stone, faced and coped with granite, substituted.

Plans, &c., prepared by this department and work supervised by D. H. Waterbury, of this department, St. John, N.B.

Clerk of works—James McAnna.

Contractor—J. S. Leighton.

#### PROVINCE OF QUEBEC.

##### GRANBY.

##### PUBLIC BUILDING.

This building, which was described in my last report, is now completed, fitted up with a hot water heating apparatus, and is being fitted up with post office fittings, furniture, &c.

Plans, &c., prepared by this department.

Clerk of works—Wm. Cox.

Contractors for building—Dussault & Pageau.

Contractors for heating—Alex. Mackay & Co.

##### GROSSE ISLE.

##### QUARANTINE STATION.

The third class detention sheds Nos. 8, 9, 10 and 11 were converted into second class detention sheds, with division into passages, dormitories, kitchen, bath-rooms, &c., with water supply, drainage, &c. New windows, doors, steps, &c., were provided, and the interior of the buildings painted.

The third class detention sheds Nos. 13 and 14 were repaired and connected with the water service and drainage. The plastering in the Protestant Rectory was repaired. Fly screens were provided for the engineer's residence and the police quarters. An ice house was built to serve the superintendent and the assistant medical officer. The steamer 'Challenger' was caulked and painted and the pumps and boilers repaired.

All under the supervision of Ph. Béland, Clerk of Works.



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## L'ASSOMPTION.

## PUBLIC BUILDING.

On December 1, 1902, a contract was entered into for the construction of this building on a plot of ground situated on the south side of St. Jacques street and west side of Notre Dame street. It is a 2½-story building of brick, with stone dressing, and on a stone basement measuring 38 feet by 30 feet. The floors, partitions, stairway and roofs are wood, and the roof covering metal, excepting the roof of deck, which is covered with tar and gravel, and the floor of basement, which is concrete. The basement is for the heating apparatus, fuel and storage; the ground floor has the post office, entrance hall and lavatory, and the upper floors the apartments of the caretaker.

Plans, &c., prepared and work supervised by this department.

Clerk of works—Louis Brouillette.

Contractor—Edmond Piché.

## LEVIS.

## CATTLE QUARANTINE.

The medical superintendent's office has had the interior renovated, the exterior painted, and a gallery built outside. A detention shed for the attendants and a shed for vehicles were built. Sheds 16 and 17 had the roof covering treated with coal tar. Several sheds were repaired, a quantity of inclosure fence was built, a large quantity replaced, and a portion renovated. A new sheep barn was constructed.

All under the supervision of Ph. Béland, clerk of works.

## MONTREAL.

## CUSTOM HOUSE.

Additions were made to the parcel carriers' system, the gas lighting and the water service. A private entrance for the detectives was opened from the lobby. A glass partition, a cupboard and a table were supplied to the warehouse department.

Repairs were made to the roof, the exterior painting and the heating furnaces. The interior of the building was cleaned and painted throughout.

All under the supervision of C. Desjardins, clerk of works.

## EXAMINING WAREHOUSE.

The walls of the three entrances on the south side were demolished and rebuilt in line with the exterior wall; the space floored with steel beams carrying brick arches covered with hard wood. All the floor area of first, second and third stories was covered with hardwood. A story was added to the annex, having hardwood floor covering and concrete roof covered with gravel. An elevator well and an iron stairs were built on the south-west side. A new entrance was opened on the south-east side, giving access to first and second floors. All the old partitions were removed and replaced by iron screens, dividing the departments, and glazed partitions in the offices. A hardwood counter was placed the full length of the passage to serve each department. New water closets were fitted up on the first and second floors. Additions were made to the steam heating surface, and the system changed to vacuum low pressure. All the walls and brick partitions on first and second floors were repaired and whitewashed, the woodwork painted as also the external woodwork of openings and the main cornice. The hardwood of partitions, counters, &c., was oiled and varnished.

All under the supervision of C. Desjardins, clerk of works.



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## INLAND REVENUE BUILDING.

Two rooms were repaired, painted and furnished, as also a room for the collector. Additional gas jets and a wash basin were put in and repairs effected to roof and gas and water services.

Work done under the supervision of C. Desjardins, clerk of works.

## POST OFFICE.

The customs postal package office was enlarged, wickets were opened in the wall facing the lobby and counters, cupboards and furniture supplied. The electric lighting system was renewed and added to. A portion of the water service piping was renovated and new hose supplied. New telephones and a lightning arresting apparatus for the protection of the motors were put in, and some minor repairs effected.

Work executed under the supervision of C. Desjardins, clerk of works.

## QUEBEC.

## ARTILLERY WORKSHOP.

The necessary benches and other fittings, as well as the shafting for power, were fitted up, and this building, of which there is a description in my last report, is now completed.

Plans, &c., prepared by this department.

Contractor for construction—Wm. Stuart.

Clerk of works—Ph. Béland.

Contractor for steam heating (vacuum system)—O. Picard & Son.

Contractor for electric lighting—Slade Electric Company.

Contractor for shafting—Carrière Lainé & Co.

## CITADEL—GOVERNOR-GENERAL'S QUARTERS.

Repairs were made to electric lighting and bells, plumbing and to terrace inclosure; the mast was repainted and provided with new ball and halyards, and the interior of the building cleaned and put in order for the annual visit of Their Excellencies.

Work done under the supervision of Ph. Béland, clerk of works.

## CUSTOM HOUSE.

The caretaker's quarters were replastered, and new vault doors with combination locks were provided. A hardwood floor has been laid in both kitchens, the telephone has been inclosed, some articles of furniture were supplied, the electric bells and the clocks were repaired and kept in order and minor repairs made to plumbing, &c.

All under the supervision of Ph. Béland, clerk of works.

## EXAMINING WAREHOUSE.

The roof and the boilers were repaired, the plumbing of the first floor was renovated and some articles of furniture were supplied.

All under the supervision of Ph. Béland, clerk of works.

## IMMIGRATION BUILDING, LOUISE BASIN.

Some partitions and bunks were put in, also some guard rails of iron pipe; a private staircase was built for the use of the assistant matron. The boiler, plumbing, drainage, pump, electric light and electric bells were repaired, and some utensils for



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the kitchen provided. Some painting and glazing were done, and a number of blinds, carpets, linoleums, oil cloths, clocks and articles of furniture were supplied.

All under the supervision of Ph. Béland, clerk of works.

## IRON FOUNDRY.

On June 24, 1903, a contract was entered into for the construction of this building in St. John Bastion on D'Auteuil street. It is to be of stone, 154 feet by 55 feet, outside measurement, 25 feet in height from floor to eaves, and 36 feet from floor to apex of roof. There is to be an annex 13 feet by 17 feet at one end, to contain lavatories and closets. The roof principals are to be of iron and the roof of wood covered with metal. All the windows are to be grated, and there is to be one entrance at each end. It is intended to heat the building with steam.

Plans, &c., prepared by this department, and works supervised by Ph. Béland, clerk of works.

Contractors for the construction of the building—Dusseau & Pageau.

## MARINE AND IMMIGRATION BUILDING, AND QUEEN'S WHARF.

The caretaker's residence was painted and papered inside; a partition was removed and the plumbing repaired, as also the plumbing in the Marine office.

All under the supervision of Ph. Béland, clerk of works.

## POST OFFICE.

The plumbing of the water closets was overhauled and a bath and a lavatory basin put in. A portion of the stud partition of the registration office was removed and replaced by a counter and glazed screen; this office was floored in hardwood. The customs postal packets office and the office of the mail conductors were renovated and in part supplied with new furniture, linoleums, &c. The electric lighting and clocks were overhauled and in part renovated. A number of offices were cleaned and painted.

All under the supervision of Ph. Béland, clerk of works.

## THREE RIVERS.

## POST OFFICE.

A pair of hot water heating furnaces were put in to replace others worn out. The heating coils on ground floor were enlarged and some repairs made to plumbing, &c.

Under the supervision of John Cowan, of this department, engineer.

## PROVINCE OF ONTARIO.

## CLINTON.

## PUBLIC BUILDING.

A contract was entered into on July 28, 1902, for the construction of this building on a lot occupying the re-entrant angle formed by the junction of King and Victoria streets, and the works are now well advanced. It is a 2½-story brick building on a stone basement 39 feet long by 34 feet broad, with a 1-story adjunct 17 feet by 29 feet in rear, and a 4-story brick clock tower 10 feet square facing the junction of the streets. The floors, stairs, partitions and roof are of wood, the roof covering of metal, excepting the deck, which is covered with tar and gravel. The basement is for the heating apparatus and fuel; the ground floor of the main building for the post office, mail



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entrance, stairways, water closet and porch, and that of the adjunct for the examining warehouse and collector's office. On the first floor are to be 5 rooms, a bath-room and a water closet room, and in the attic 6 rooms. Heating is to be by hot water.

Plans prepared and work supervised by this department.

Clerk of works—Henry Stevents.

Contractor for construction of building—S. S. Cooper.

Contractors for heating—Martel & Langelier.

## DESERONTO.

### PUBLIC BUILDING.

This building is completed, and has a hot water heating system installed. Fittings and furniture for the various departments are being put in.

Plans, &c., prepared by this department.

Clerk of works—John Dalton.

Contractor—Richard Sheehy.

Contractor for heating—P. Leclerc, fils.

## FORT WILLIAM.

On July 22, 1902, a contract was entered into for the construction of this building on a plot of ground situated on the east side of May street. It is a 2½-story building, with stone dressings, and on a stone basement 58 feet by 42 feet, having at the south end a 1-story adjunct 18 feet by 23 feet of the same materials. The ground floor contains the post office, vestibules, stairway, brick vault, lavatory and water closet, in the main portion, and the examining warehouse in adjunct; on the first floor are the customs long room, 3 offices, a brick vault, a water closet and a stairway; in the attic are the caretaker's apartments. The floors, stairs, partitions and stairways are wood, the roof covering metal, excepting that the decks are covered with tar and gravel and that the basement flooring is concrete.

Plans, &c., prepared by this department.

Clerk of works—W. S. Rankin.

Contractor—Robert Cameron.

## GUELPH.

### ADDITIONS TO AND ALTERATION OF PUBLIC BUILDING.

On March 28, 1903, a contract was entered into for these works. The original building, which is situated at the intersection of Wyndham and Douglas streets, facing St. George's square, was commenced in 1874 and completed in 1877. It is intended to remove the roof, carry up the outside walls an additional story surmounted by an attic; add 12 feet to the length of the building, and build a tower 14 feet square and 4 stories high, exclusive of the clock cupola, in front of the middle of the St. George's square façade. The original main stairway from basement to attic, together with all the partitions and brick safes on ground floor are to be removed and new brick safes are to be built on basement, ground and first floors. Of the 12-foot addition to the length, a portion 10 feet in depth is to be a one-story porch, the middle portion is to be a staircase from basement to attic, and the rear a 2-story and basement portion to contain the postmaster's room on ground floor, with a lavatory and water closet on first floor and in basement. In the completed building there will be a main entrance to the post office through the tower, and an entrance to the upper floors by the porch in the addition. The ground floor is to be devoted to post office purposes, the first floor



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to the Customs, the second floor to the Inland Revenue, and the third floor to the caretaker.

Plans, &c., prepared by this department.

Local architect—L. C. Wideman.

Contractor—John Kennedy.

## KINGSTON.

## CUSTOM HOUSE.

Repairs were made to entrance gate, gas, water and plumbing services, locks and furniture under the supervision of Arthur Ellis, architect and clerk of works, Kingston, Ont.

## POST OFFICE.

New vestibule doors were put in, new brass signs were supplied, also new flooring in the vestibule and a new truck for transfer of mails. The gas mains were altered and repairs were made to plumbing, gas fitting, heating, newspaper bunks, fittings, &c. All the foregoing under the supervision of Arthur Ellis, architect and clerk of works, Kingston, Ont.

## ROYAL MILITARY COLLEGE.

*Gymnasium*.—This building, which was described in my last report, is now nearing completion. A new hot water heating apparatus is being installed and plans for fittings are prepared.

Plans, &c., prepared by this department, and work supervised by Arthur Ellis, local architect and clerk of works, Kingston, Ont.

Contractors for construction of building—Sullivan & Langdon.

Contractors for heating—McKelvey & Birch.

*Residence, Gymnasium*.—Adjoining the southerly end of the foregoing is a 2½-story building on a stone foundation, 38 feet by 35 feet. There is a basement under the entire building. The building is heated by hot water.

Plans prepared by this department, and work supervised by Arthur Ellis, architect, Kingston, Ont.

Contractors for building—Sullivan & Langdon.

Contractors for heating—McKelvey & Birch.

## LONDON.

## DRILL HALL.

On December 6, 1902, a contract was entered into for the construction of this building. It is to be constructed of brick with stone dressings and on a stone basement, measuring 252 feet on Dundas street, and 120 feet on Granville street. There are two stories and basement in the Dundas street façade, the middle 50 feet of which is carried up an additional story with octagonal angle bastions ending in circular crenellated towers, and contains the principal entrance to the drill hall. On Granville street there are two stories and unexcavated basement, and at the farther end one story and basement. Hemmed in on three sides by these leantos is the main drill hall, 80 feet by 186 feet, 50 feet from floor to apex of roof, and 35 feet to eaves. In the basement are to be a bowling alley, a dressing room, lavatories and water closets, boiler and fuel rooms, and four store rooms. On the ground floor, besides the main hall, are 8 armouries, a gunshed, 3 harness rooms, 2 C.O. rooms, 2 Q.M. rooms, 2 officers' rooms, a guard room, a bugler's room, a work room, a spare room, &c.; on the first floor 2 armouries, a band-



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room, a lecture room, a room for each army medical corps and army service corps, a C.O. room, 2 officers' rooms, a sergeant's mess, Q.M. stores and 2 water closets and lavatory rooms. The attic contains 6 rooms and a bath room for caretaker. The roof principals are iron, the partitions brick and floors, stairs and roofs of wood, excepting the floor of basement which is concrete, and the stairs of main hall which are iron. The roof covering of main hall is metal, and that of lean-to tar and gravel.

Plans, &c., prepared by this department.

Local architect—F. Henry.

Contractors—Sullivan & Langdon.

## OTTAWA.

### CENTRAL EXPERIMENTAL FARM.

There were cleaned, tinted and painted 15 rooms among the various buildings.

*Bacteriological Laboratory.*—This is a 1½ story brick building on a stone basement, surmounted by a wooden roof. It measures 35 feet by 44 feet, and consists of a basement containing a furnace and fuel-room, 2 laboratory rooms, a water closet and a stairway; a ground floor having 3 rooms and an attic, 4 rooms. The basement floor is cement, and the remaining floors wood.

Plans, &c., prepared and works superintended by this department.

Clerk of works—P. Canty.

### EASTERN BLOCK, DEPARTMENTAL BUILDING.

There were 6 drop lights installed in the Auditor General's Department, 4 in the Secretary of State Department, 1 in the Justice Department, 1 in the Privy Council office, 2 in the Indian Department, and 3 in the Finance Department; there were new wash basins fitted up—3 in the Auditor General's Department, 2 in the Secretary of State Department, and 4 in the Justice Department; portable electric lamp stands—2 in the Justice Department and 1 in the Indian Department; electric bell connections were wired—2 in the Justice Department, 1 in the Indian Department, and 2 in the Finance Department. A new radiator was fitted up in the Secretary of State Department and a number of shades supplied.

Walls for coal bin, 30 feet long and 10 feet high, were built in boiler house and 3 boilers re-set. One new brick partition was built; plastering in 8 rooms was patched; 4 grates and 1 fireplace were supplied; cement floor in 3 rooms was renovated; 2 doors were cut in brick walls; hardwood flooring was laid in 14 rooms; six new windows and frames were put in; 3 windows were glazed and painted; 105 articles of furniture were repaired and 196 oiled, painted or varnished; 36 rooms were cleaned, tinted and painted; also there were furnished 12 cupboards or shelving, 13 tables, 7 chair cushions, 4 bookcases, 2 desks, 2 rifle racks, 7 brass rods and curtains, 1 screen, 1 cabinet, 2 green baize doors, picture moulding in 2 rooms, cover for 1 sofa and an inclosure for a telephone. Two rooms were altered and renovated.

All done under the supervision of this department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

### GOVERNMENT HOUSE.

An addition, 18 feet 6 inches x 16 feet, was made to side of potting shed and fitted with tables and shelves. Tables, table beds, &c., were built in greenhouses, vinery, cold house and rose house, as well as a number of hotbed frames and sashes.

The cow stable and the adjoining store-room had the roof raised and straightened; the cow stable was enlarged and re-fitted, re-floored and re-ceiled; had new cow stalls and loose box fitted up, and new drain and ventilating pipe put in.



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The heating apparatus at the cottage had additional coils and radiators put in, as well as a new furnace to replace the original one, which was worn out. and the pipes, coils and radiators were bronzed.

At Government House a coil was put in the servants' hall, a radiator in room No. 15, some gate valves in the carnation and smilax houses and all the pipes, coils and radiators bronzed. The wooden paving in carriage porch was replaced by brick, and the cut stone sill of door raised to suit. The chimney of potting shed was lengthened; firebrick backs were put in 4 fireplaces; 3 cooking ranges re-lined with firebrick, and the terrace granolithic steps repaired. There were supplied 50 lengths of table for entertainments, 4 fancy tables and 153 feet length of tables for curling rink, 12 pairs of trestles; 2 wardrobes, 10 sets brass bed-room furniture, 6 screens, 2 cabinets, 1 cupboard, 4 stepladders, 3 waiter trays, 2 book racks, 5 window screens, 3 sliding ventilators, 2 glass doors and 2 cases for hose. Repairs were made to 2 cabinets, 5 book-cases and a large number of chairs, among the number 175 cane-seated chairs. Four ranges and 22 stoves with pipes were cleaned and repaired, and a large number of renewals of parts of ranges made; 564 inches of kitchen coppers were re-tinned and repaired; 14 closet cisterns were overhauled and a new flushometer and 4 sink tanks put in. The slate sink in kitchen, as well as the water service throughout, were repaired and in part renovated. New transformers were installed in the electric plant, while the bell service was kept in good order and repair. The basement flooring, which was cut when laying drain under tennis court, was laid anew; 800 lineal feet of 9-inch tile pipe, with 4 cedar curb clean-outs were put in to connect the drainage with the city sewer on Dufferin road; also 492 feet of 6-inch and 153 feet of 4-inch tile in subsidiary drains. A connection was made for surface water with iron grating and cedar curb 2 feet 6 inches x 2 feet 6 inches; 200 lineal feet of 1½-inch water supply pipe was laid from stable to byre, and a branch to workshops, in lieu of the 1-inch pipe taken out.

The roof of log cabin was renovated, the toboggan slides were repaired and strengthened, and a fence 265 feet long by 2 feet in height built to protect the ivy at the front of hall. Of the fences, 35 lineal feet of iron fence, with cut stone pillars, were built at lodge, as well as 30 feet of wooden picket fence, 554 feet lineal of wooden fence were rebuilt, as well as one large gate; two pairs of new gates were built and remainder of the fence and gates had minor repairs effected; 85 feet lineal of plank crossings were laid, and the sidewalks throughout repaired and in part renovated.

At the hall there were 899 yards distempered, 4,744 yards painted and 304 yards stained and varnished, in addition to 175 chairs stained and varnished. There were 1,168 yards of painting done throughout the various subsidiary buildings; 1,640 feet superficial of glass was re-glazed in greenhouse roof, as well as 24 hotbed sashes and the glazing of all the buildings repaired. There were 2,425 yards carpet, 1 large and 9 small rugs and 19 squares lifted, cleaned, repaired and relaid. A large quantity of crockery and glassware was supplied, also some table and bed-room napery.

A new float was placed under large boathouse, which was repaired, straightened and strengthened. Two new doors, as well as floor rollers and wire corridor screens were put in new boathouse. Floors were laid in curling rink when required, wires strung for Chinese lanterns, and tables, tents and decorations attended to.

A large variety and number of gardening tools and necessities were supplied, for kitchen and for flower garden, as well as bulbs, plants, seeds, &c.

Some of the hedges were grubbed out, some grading, sodding and tree planting was done, and the main avenue was gravelled, rolled and otherwise improved. The ice-houses were packed with ice. The roofs, paths, slides, rinks, &c., were cleared of snow by the departmental staff, by whom the grounds, lawns, gardens and plant-houses were maintained.

The usual periodic cleaning and the packing and unpacking were done; arrangements for and attendance on entertainments were furnished, and the rinks, slides, &c., kept in order.



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Work carried out and maintained under the supervision of this department by the departmental staff.

Clerk of works—Wm. H. Hutchison.

#### GEOLOGICAL MUSEUM.

The hot-water furnace was repaired and the piping thereof partly renovated. The laboratory was fitted up for gas lighting; 42 auer lights and 9 gas brackets were placed as required, and a 6-pipe gas radiator was installed in the laboratory.

The annex was fitted up with wooden partitions, doors, stairs, floors, tables, &c. The steps of the museum stairway were fitted with rubber pads; a room in basement was fitted up for laboratory purposes; nine rooms were cleaned, tinted and painted, as well as all the interior of the annex; a large partition was glazed; twenty pieces of furniture were repaired and eighteen pieces painted or oiled and varnished.

Work done under the supervision of this department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

#### DEPARTMENT OF INTERIOR, QUEEN STREET.

Changes were made in electric bell wiring, and an additional connection made with messengers' room. Some new electric lights were added and some shades supplied under the supervision of Wm. King, mechanical engineer.

#### IMMIGRATION COMMISSIONER'S OFFICE, QUEEN STREET.

Six chemical fire extinguishers were supplied; 10 drop lights and 1 portable lampstand were installed, also electric bells for one of the offices, under the supervision of Wm. King, mechanical engineer.

#### LANGEVIN BLOCK.

An electric clock in the Interior Department was connected with the telegraph lines outside. There were installed in the Interior Department 15 droplights, in the Post Office Department 36 droplights, and in the Agriculture Department 16 droplights. In the Interior Department 3 portable lampstands, 3 in the Post Office Department and 8 in the Agriculture Department. One 8-light electrolier was fitted up in the Interior Department; a motor fan and a rotary pump in the Agriculture Department and 2 electric bell connections in the Interior Department. Telephone wiring was done in the Agriculture Department and the Post Office Department, the electric lighting in the Agriculture Department was readjusted and a heating coil changed in the Interior Department. Twenty-three rooms were cleaned, tinted and painted; 3 brick partitions, 4 wood and 1 glazed, were erected; 5 sets of shelving were supplied, exclusive of 60 roller shelves; 6 cupboards and pigeonhole cases were supplied, as also 30 tables, 6 map cases, 2 bookcases, 3 chairs, 5 chests of drawers, 8 cabinets, 3 stepladders, 1 chest, 3 deflectors, 3 ventilators, 8 chair cushions, 3 green baize doors, 3 window poles and 7 brass rods and curtains. Picture moulding was fitted up in 3 rooms, cement base in 2 rooms, doors cut in 2 rooms and fireplaces repaired in 2 rooms. One hundred and ninety pieces of furniture were repaired, and one hundred and forty oiled, varnished, painted or altered. One partition was painted, 1 was varnished, and 2 sofas were re-upholstered. The brickwork of 4 hotwater furnaces was renovated, and plaster patched in 6 rooms. All under the supervision of the department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.



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## LABOUR BUREAU.

Bell wiring was done for 3 rooms, with call bells, &c.; 1-3 light electrolier, 1-2 light electrolier and 5 droplights were installed.

Four rooms were cleaned, tinted and painted; 3 rooms were fitted with picture moulding; the vault was fitted up with pigeonhole cases and shelving; 6 stepladders and 4 cupboards were supplied; 15 pieces of furniture were oiled and varnished and 20 pieces altered.

Work done under the supervision of the department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

## MILITARY STORE BUILDING.

The building was wired for electric light by the departmental workmen; speaking tubes were installed, and a porcelain sink fitted up and connected. All under the supervision of Wm. King, mechanical engineer.

## MAJOR'S HILL PARK.

A 2-story kiosk is in process of construction—to consist of a basement of stone to be used as a tool house, 17 feet x 26 feet and 13 feet in height, surmounted by a covered wooden pavilion of like size surrounded, by a gallery 6 feet in breadth, supported on brackets or corbels built into the stonewalls below. The pavilion will be constructed of ornamental open framing, somewhat gothic in treatment.

General repairs were made to the old greenhouses; some new benches were supplied and those in use repaired. For the better distribution of water, cast-iron pipe, 4-inch and 3-inch, was laid (1,220 feet), with gate valves, hose connections, &c.

Work done under the supervision of this department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

## ROYAL OBSERVATORY.

A contract for the construction of this building was signed on August 9, 1902, and the work is in progress.

The building was described in my report of last year. Plans, &c., prepared and work superintended by this department.

Clerk of works—P. Canty.

Contractor—Theophile Viau.

## REPAIRING STREETS, ETC.

The roadway between Rideau street and the canal was graded and macadamized, and a turfed sloping terrace formed between this roadway and the park. The wooden sidewalk at the Printing Bureau was removed and replaced by a new one of granolithic. Planking of yard at Geological Museum and at Printing Bureau was renovated.

Scraping, cleaning and general repairs were done to the various roadways, footpaths and streets under the control of the department. Rubbish, scrapings and ashes were removed from the east block, west block, parliament buildings, the workshops, printing bureau, the museums, the several rented buildings and the various streets and deposited at Nepean Point; the grass at printing bureau, Wellington street, two bridges, fisheries museum and geological museum was kept clipped, and the ashes removed from the boiler houses; the roadways, sidewalks, footpaths, roofs and yards kept clear of snow during the winter.

Work done by the departmental staff, C. Leblanc, foreman.



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## PARLIAMENT BUILDING.

A downward plenum system of ventilation, to be used either independently or as an auxiliary to the existing system, was installed over the Commons chamber. The air is taken through the ventiduct turrets at the north end of the House and driven by fans, attached to electric motors, through a tempering chamber from which it passes, through the ceilings over the gallery, into the House. The Senate bathroom in basement was entirely renovated and fitted up with porcelain baths, showers, &c. There were furnished throughout the building, 1-5 light electrolier, 1-4 light and 1-3 light; an electric cooking apparatus was put in at the office of the Deputy Speaker of the Commons; 13 droplights and 6 wall brackets were put in, also 6 water closets, 3 urinals, 13 wash basins, 4 radiators, 600 feet of pipe in steam coils, exclusive of that for ventilation, as well as a quantity of wiring for telephones, bells, &c.

A new porch was erected at the messengers' entrance. One new hardwood floor was laid. A quantity of painting, tinting and papering were done, requiring the services of one workman for 11 months, and one man was continuously employed for the entire year taking up and putting down carpets, making repairs, &c., in connection therewith. One hundred and twenty-three pieces of furniture were repaired, 86 were painted or varnished, and the following articles were supplied, viz.: 8 wardrobes,, 17 cupboards, 3 chair cushions, 1 book case, 2 sets shelving, 1 chest, 1 telephone closet, 4 rods and curtains, 1 screen, 12 newspaper files, 200 rollers and 1 ventilator:

Work done under the supervision of this department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

## PARLIAMENT GROUNDS.

Repairs were made to woodwork and drains generally throughout the grounds. Some new seats were supplied, and a new stairway built down hillside at west end of Lovers' Walk.

The water mains for use in watering the grass were overhauled, and some valves, &c., added. A new water main was laid from the main at Supreme Court.

Work done under the supervision of this department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

## POST OFFICE.

The sub-basement fronting on the canal was finished for use as an examining warehouse for the Customs. The stone walls were lined with terra cotta, with a 4-inch cavity between the terra cotta and stone wall plastered; the vaulted ceiling was plastered, the floor was concreted, the middle compartment finished with a cement floor, and the lateral compartments floored in wood. A hot water heating system was put in with the furnaces, and a brick inclosed coal bin at rear of the middle compartment. A stairway was constructed from the sub-basement to the basement. The middle and the south end of the basement were overhauled, the brick division walls were removed and glazed partitions substituted; counters and fittings were put in, as well as new flooring. Three new water closets were fitted up. An electric elevator, with a travel from basement to attic, was constructed in the well hole of the stairway, at the south-western angle of the building. A fan driven by an electric motor was placed in attic inclosed in a specially built room lighted by a skylight, and from this a tube containing a hot water coil is carried down to ground floor ceiling for using a plenum system of ventilation for the post office. Two new washbasins and one new sink were put in.

Works carried out under the supervision of this department.

Mechanical engineer—Wm. King.

Clerk of works—S. Adams.



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## PRINTING BUREAU.

One of the steam boilers was re-set in brickwork; the roof of the shop was re-shingled and repairs to woodwork and furniture generally done, which kept one carpenter constantly employed; also a plumber and a steamfitter, at repairs in their line, about one-third of the year.

Work done under the supervision of the department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

## SUPREME AND EXCHEQUER COURT BUILDING.

The electric bell wiring was re-arranged, some new bells added and a new wash-basin fitted up and connected. One of the heating boilers was re-set in brickwork.

The library was removed to another room and new shelving supplied therefor, as well as for one of the rooms in basement. One of the Exchequer Court rooms was fitted up; 4 rooms, passage and stairway were cleaned, tinted and painted; 20 pieces of furniture were repaired; 15 pieces were cleaned, varnished and painted, and the following articles supplied, viz.: 3 tables, 2 brackets, 5 rods and curtains, 1 bookcase and 3 green baize doors.

Work done under the supervision of this department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

## WESTERN BLOCK, DEPARTMENTAL BUILDING.

Gas connection was made for use of standards in Inland Revenue Department. Portable electric lamp stands were installed, 2 in Railways and Canals Department, 3 in Marine Department, 8 in Public Works Department and 1 in Militia Department; electroliers, 2 of 2 lights in Public Works Department; droplights, 5 in Railways and Canals Department, 16 in Marine Department, 11 in Customs Department, 9 in Public Works Department and 2 in Militia Department; motor fans, 2 in Railways and Canals Department, 1 in Public Works Department, 2 in Militia Department and 3 in Inland Revenue Department. Four additional radiators and one new coil were fitted up; electric bell connections were made, 3 in Railways and Canals Department, 3 in Marine Department, 3 in Public Works Department and 1 in Militia Department. Speaking tubes were put in for Customs Department, 1 washbasin in Militia Department, and some re-arrangement of electric lights carried out and a number of shades supplied. 56 rooms were cleaned, tinted and painted; 9 rooms had hardwood floors laid; 4 wooden and one glass partition were built; 5 rooms had picture moulding; 451 articles of furniture were repaired; 228 articles of furniture were oiled, varnished or painted; 2 doors and frames and 2 gun carriages were supplied, as well as the following articles of furniture, viz.: 16 bookcases, 17 chests, 15 file cases, 30 cupboards, 7 desks, 10 tables, 4 deflectors, 36 newspaper files, 575 packing boxes, 125 photo. frames, 14 brass rods and curtains, 34 chair cushions, 5 screens, 20 drawing boards, 16 pairs of trestles, 13 stepladders, 4 slopes, 2 gun racks, 3 stands, 1 truck, 152 map rollers, 1 telephone cupboard, 1 green baize door and 5 map racks; 3 wooden tanks were built and 950 panes of glass put in.

All the foregoing under the supervision of this department.

Mechanical engineer—Wm. King.

Clerk of works—F. Breton.

## BUILDING AND GROUNDS GENERALLY.

In addition to the works mentioned in the foregoing, there are innumerable smaller works, e.g., there were 275 items of repair done by the roofers, and propor-



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tionately much more in connection with the other trades. Besides all these, in connection with the various other buildings, the property of the government, there are similar works of repair, painting, furnishing, tinting, &c., in connection with a number of rented buildings; also such works as repairs to and renewals of coal and other sheds, as well as works of a general character, such as the erection and taking down of porches, the winter boarding of outside steps, the moving of furniture, the putting up and taking down of summer blinds and winter sashes, the beating of carpets, minor repairs to glazing, painting, woodwork, furniture, &c., the removal of the snow from the grounds, buildings, roads and foot-paths, which work was done by the departmental staff.

## SARNIA.

### PUBLIC BUILDING.

This building, which was described in a previous report, is in progress, and is expected to be completed during the next fiscal year.

Plans, &c., prepared by this department.

Clerk of works—Marcus R. Burrows.

Contractor for building—Geo. A. Proctor.

Contractors for heating—Alex. Mackay & Co.

## TORONTO.

### CUSTOM HOUSE.

A portion of the wall, about 175 feet, was under-pinned with concrete and brick set in cement. A settlement crack in south wall was made good, including the provision of some new stone sills and mullions.

Work performed under the supervision of S. G. Curry, architect.

### EXAMINING WAREHOUSE.

The first floor was wired throughout for incandescent electric light, under the supervision of S. G. Curry, architect.

### POST OFFICE.

An addition was constructed to the rear of the main building, and alterations made to the building generally. *These works were expected to be completed during the fiscal year, but were delayed by strikes in the building trades.* A scoria block pavement was laid in the north-west yard. Two rooms were provided on the first floor for the postmaster, the end of the first floor corridor partitioned off for use as a waiting room, and a large room on same floor divided by a partition into two, one for the inspector and the other for his staff of clerks. These four rooms were cleaned and painted.

Works carried out under the supervision of S. G. Curry, architect.

### POSTAL STATION 'A.'

A new concrete floor was laid throughout the old portion of the building, and the interior was cleaned and whitewashed throughout, under the supervision of S. G. Curry, architect.



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## POSTAL STATION 'B.'

A few minor alterations and repairs were effected under the supervision of S. G. Curry, architect.

## POSTAL STATION 'C.'

On May 21, 1902, a contract was entered into for the construction of the building on a site fronting on Queen street, with Lisgar and Bell streets on either side and a lane in rear. It is a 2-story brick building with stone dressings and on a stone basement, the rear one-half of which is excavated and finished as a basement. It has a frontage of 79 feet by a depth of 74 feet 6 inches. There is a brick safe in basement and one on ground floor, and brick partitions in basement. The columns and beams supporting the floors are of iron, the ground floor and first floor partitions and floors as well as the stairs and roof are wood, and the floor of basement concrete. The cornice is metal, and the roof covering of felt, tar and gravel. The basement contains the furnace and fuel-room, a brick safe, a closet-room and the stairway. The ground and first floors are for post office purposes. Heating is by hot water.

Plans, &c., prepared by this department and work supervised by S. G. Curry, architect.

Clerk of works—Wm. Forbes.

Contractors for construction of building—F. D. Brown and Geo. Love.

Contractors for hot water heating system—Harrison & Robertson.

## RECEIVER GENERAL'S AND INLAND REVENUE BUILDINGS.

The treasury vault was increased in size, the additional space being taken from the private office adjoining.

All under the supervision of S. G. Curry, architect.

## PROVINCE OF MANITOBA.

## WINNIPEG.

## CUSTOM HOUSE.

New macadam pavement boulevard and sidewalk were laid on York street. Additions and repairs were made to plumbing, a cork carpet and a desk were supplied, and repairs were made to gas fitting, plumbing and porch door.

Work done under the supervision of J. Ernest Cyr, clerk of works, Winnipeg.

## DOMINION LANDS OFFICE.

Additions were made to plumbing and a few articles of furniture supplied.

Work supervised by J. Ernest Cyr, clerk of works, Winnipeg, Man.

## EXAMINING WAREHOUSE.

The heating and plumbing were entirely renovated. Alterations of and additions and repairs to the building were effected.

Work supervised by J. Ernest Cyr, clerk of works, Winnipeg, Man.

## IMMIGRATION HALL.

New bells, new hospital and kitchen ranges, new furniture (beds, tables, wash-stands, &c.), were fitted up and furnished. A floor was laid in hospital, new utensils



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furnished to kitchen. A typewriter desk was supplied and repairs done to glazing, painting and carpentry.

All under the supervision of J. Ernest Cyr, clerk of works, Winnipeg, Man.

#### POST OFFICE.

The plumbing was renovated throughout, the elevator doors were altered. A quantity of furniture was supplied to the post office, the bag rack was repaired, and some minor repairs made.

All under the supervision of J. Ernest Cyr, clerk of works, Winnipeg, Man.

### NORTH-WEST TERRITORIES.

#### CALGARY, ALTA.

##### COURT HOUSE.

The hot water furnaces were overhauled, the water service of the building was connected with that of the town, and some minor repairs effected, under the supervision of Paul Paradis, resident engineer.

##### IMMIGRATION BUILDING.

New plumbing and drainage were put in, new stoves were furnished, and the storehouse and fuel shed painted, under the supervision of Paul Paradis, resident engineer.

##### POST OFFICE.

The general delivery was altered and improved, and new stone steps were built at the main entrance, under the supervision of Paul Paradis, resident engineer.

#### CARNDUFF, ASSA. EAST.

##### COURT HOUSE.

A contract was entered into on February 11, 1902, for this building, which was described in my report of last year, and which is now completed, fitted up with a hot water heating apparatus, and furnished ready for occupation.

Plans, &c., prepared by this department.

Clerk of works—J. H. Taylor.

Contractors for construction of building—J. M. Harrington & Co.

Contractors for heating system—F. & R. Colter.

#### EDMONTON, ALTA.

##### JAIL.

Tenders are received for the construction of this building, which is to be situated east of the town site and between it and the Saskatchewan river. The building is to consist of a 2½-story administration block 69 feet 6 inches frontage by 52 feet 8 inches depth, having a 2-story and basement extension in rear 56 feet deep by 52 feet 8 inches wide, and having in front a 3-story tower 14 feet square. The basement will have an adjunct 20 feet by 17 feet for fuel room and one 5 feet by 14 feet on either side of the tower. The administration block basement is to contain a boiler room, a fuel room, a laundry, a cellar and a number of storerooms; the ground floor a guard



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room, a jailer's office, stores and a kitchen; the first floor, 2 work-rooms, a parlour, a dining-room and a kitchen. The cell wing is to have 14 cells on each of the three flats. The walls and partitions are to be of brick on concrete footings. Concrete will also be used for the cell fronts and the floors—those in administration block to be covered with wood. The roofs are to be wood covered with metal.

Plans, &c., prepared by this department.

## MACLEOD, ALTA.

## COURT HOUSE.

On October 8, 1902, a contract was entered into for the construction of this building, which is to be of brick, 2½-stories, with stone dressings and on a stone basement, measuring 56 feet by 34 feet, exclusive of projecting porches. The partitions, floors, roofs and stairs are wood, excepting the cell partitions which are brick and the basement floor which is concrete. The ground floor contains 2 vestibules, 2 stairways, a passage, 2 brick vaults, a guard room, a sheriff's office, a clerk's office, a storeroom, a kitchen, 3 cells for prisoners and 3 projecting porches. There are 4 entrances, 1 in front, 1 in rear and 2 on the right side. On the first floor, mid-length, is the court room, occupying all but 16 feet at either end and extending up into the attic. At one end of the court room are rooms for judge, jury and bar, and at the other end a room for witnesses. In the attic the space at the rear of the court room is finished as a spare room.

Plans and specifications for a hot water heating apparatus are in course of preparation.

Plans, &c., prepared by this department.

Clerk of works—C. Genge.

Contractor—Patrick Navin.

## REGINA, ASSA. WEST.

## COURT HOUSE.

A complete set of fittings were fitted up in vault and some general repairs made, under the supervision of John Morrison, clerk of works.

## CUSTOM HOUSE.

A steel safe was supplied, the building was wired and fitted up for electric lighting, and the eavestroughs and cesspool were repaired.

Work done under the supervision of John Morrison, clerk of works.

## GOVERNMENT HOUSE.

The gardener's house was cleaned, painted and papered, and an addition made thereto. New fencing and gates were erected.

Work done under the supervision of John Morrison, clerk of works.

## LANDS OFFICE.

A well was bored, a pump and piping put in; the building was wired for electric lighting and some furniture supplied.

All under the supervision of John Morrison, clerk of works.



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## POST OFFICE.

Additions were made to the fittings, some new flooring was laid, the building was wired for electric lighting, the interior was cleaned and kalsomined, and a clock, stove, &c., furnished.

All under the supervision of John Morrison, clerk of works.

## SASKATOON, SASK.

## IMMIGRATION BUILDING.

This building, which was described in my last report, was completed and fitted up for occupation during the fiscal year. A steel range and utensils were supplied the kitchen.

Plans, &c., prepared by this department.

Clerk of works—John Morrison.

Contractor—James Leslie.

## YORKTON, ASSA. EAST.

## COURT HOUSE.

A contract for the construction of this building was entered into on October 4, 1902. It is to be a 2-story wooden building, on a stone foundation 51 feet by 28 feet exclusive of a projecting wing 20 feet by 10 feet for front entrances and stairway to court-room. The basement is designed for the heating apparatus and fuel; on the ground floor are guard-room, N.C.O. room, constables' room, kitchen, 3 cells, 3 vestibules, 2 stairway halls and 4 entrances, 1 to the court-room stairway and 3 to ground floor, 1 front and 2 rear. On the first floor are the court-rom, 35 feet by 25 feet, the stairway hall, and rooms for the judge, jury and barristers. In the rear are two detached wooden buildings, one a coal shed 20 feet by 10 feet, and the other a latrine 12 feet by 10 feet.

Plans, &c., prepared by this department.

Clerk of works—B. Johnson.

Contractor—Thomas Fulton.

## BRITISH COLUMBIA.

## KAMLOOPS.

## ARMOURY.

This building, which was described in my report of last year, is completed.

Plans, &c., prepared by this department.

Clerk of work—A. Thompson.

Contractor—D. H. Campbell.

## KASLO.

## ARMOURY.

This building was described in my report of last year. It is now occupied.

Clerk of works—John Milligan.

Contractor—D. J. Maclaughlin.



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## NANAIMO.

## PUBLIC BUILDING.

A new sink was fitted up in gas inspector's office, a counter and screen in the Inland Revenue office, and the first floor walls were kalsomined inside and the wood-work painted.

Work done under supervision of Wm. Henderson, of this department, Victoria, B.C.

## NELSON.

## ARMOURY.

This building is completed.

Plans, &c., prepared by this department; construction supervised by Wm. Henderson, of this department, Victoria, B.C.

Clerk of works—J. A. Macdonald.

Contractor—W. G. Gillett.

## PUBLIC BUILDING.

This building, which was described in a previous report, is now completed and being fitted up for occupation.

Plans, &c., prepared by this department; construction supervised by Wm. Henderson, of this department, Victoria, B.C.

Clerk of works—J. A. Macdonald.

Contractors for the construction of building—Viau & Lemoine.

Contractor for hot water heating apparatus—R. J. Nott.

## NEW WESTMINSTER.

## PUBLIC BUILDING.

Fittings and furnishings were supplied and fitted up in the offices of the Dominion lands agent, the Crown timber inspector and the postmaster. A clock was supplied to the post office.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## REVELSTOKE.

## ARMOURY.

Building completed under the supervision of Wm. Henderson, of this department, Victoria, B.C.

Plans, &c., prepared by this department.

Clerk of works—J. M. Kellia.

Contractor—John Kernahan.

## ROSSLAND.

## PUBLIC BUILDING.

Building completed and in process of fitting and furnishing.

Plans, &c., prepared by this department.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

Clerk of works—R. W. McGregor.

Contractor for building—Thos. Bradbury.

Contractor for heating—W. E. Vanstone.



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## VANCOUVER.

## DRILL HALL.

A drain was laid to take surface water from the shooting gallery and alley floors. Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## PUBLIC BUILDING.

An addition 40 feet by 24 feet was erected for the use of the Post Office Department. New quarters were rented in the Lewis building, adjacent to the post office on Granville street, and the examining warehouse, express and postal package office and dead letter office temporarily installed. The roof of the examining warehouse and of the main building, as well as the gutters and down pipes were repaired throughout.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## VICTORIA.

## OLD CUSTOM HOUSE.

The plumbing was repaired and the water service pipes renovated, under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## PUBLIC BUILDING.

A new entrance was cut in outside wall and fitted with door, and a room fitted up for reception and despatch of foreign mails. An opening between bonded warehouse and corridor in basement was cut and fitted with door. The entire examining warehouse has been re-fitted and re-shelved for use of customs postal packages. Shelving for post office was fitted up in basement, and a clock supplied to the post office; the archway leading to main staircase and elevator was fitted up with doors and glazed fanlights. A new bath and bath boiler were fitted up and connected for the use of the caretaker. A new desk was supplied to the customs long room, cork carpet to the savings bank and new armature and controller to the freight elevator motor. The double door at examining warehouse entrance was changed to a single one.

All done under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## OLD POST OFFICE.

A new felt gravel roof was put on and the plumbing was repaired. A portion of the outside woodwork was repainted.

Work done under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## WILLIAM'S HEAD.

## QUARANTINE STATION

A complete electric lighting plant, comprising 400 incandescent and 10 arc lights, was installed and an addition made to the boiler house to accommodate the new machinery. Additional water mains and hose connections for domestic supply, and for fire protection were put in. New dormer windows were added to the roof of the disinfection shed. The new laboratory was fitted up and furnished. Fences inclosing the



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residences of the captain and engineer were built. The attics of residences of captain, of caretaker and of watchman were divided into rooms, plastered and finished. A new sink was fitted up in superintendent's kitchen, a new mantel in captain's residence, and a new small boat purchased for the use of the station. The new disinfection chamber was painted and some minor repairs done.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

**YUKON TERRITORY.****DAWSON.****PUBLIC BUILDINGS**

The foundations of the several public buildings at Dawson, which were injured by thawing were made good and buildings were fitted up with eave troughs and iron ladders. A fireproof vault was constructed at the court house.

Work done under the supervision of A. A. D. Bertrand, superintendent of works and buildings.

**GENERALLY.**

Repairs and alterations have been executed and sundry articles of furniture, &c., provided, and cleaning, painting and other improvements carried out in connection with a number of buildings not herein reported.

D. EWART,

*Chief Architect.*







PART IV

CHIEF ENGINEER'S REPORT

ON

HARBOUR AND RIVER WORKS

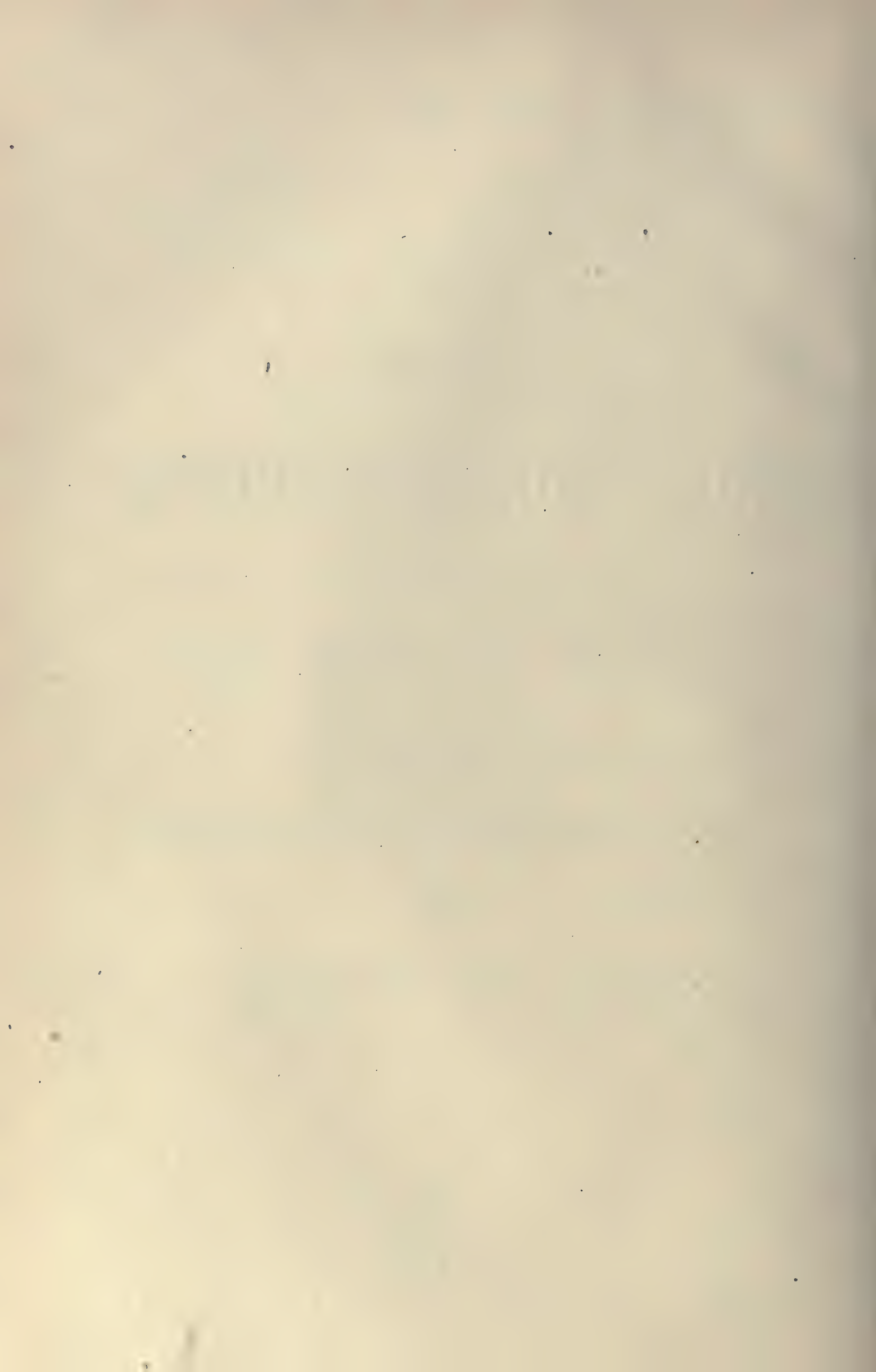
INCLUSIVE OF

GRAVING DOCKS AND DREDGING OPERATIONS

ALSO

ROADS, BRIDGES AND SURVEYS THROUGHOUT THE DOMINION







## REPORT OF THE CHIEF ENGINEER

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DEPARTMENT OF PUBLIC WORKS OF CANADA,  
CHIEF ENGINEER'S OFFICE,  
OTTAWA, December 22, 1903.

FRED. GÉLINAS, Esq.,  
Secretary,  
Department of Public Works.

SIR,—I have the honour to submit the annual report on the various works under my charge during the fiscal year ended June 30, 1903.

These works comprise the construction and repair of wharfs, piers, breakwaters, dams, wiers, bank and beach protection works; the improvement of harbours and rivers by dredging; the construction, maintenance and operation of government dredging plant; the construction and maintenance of graving docks; the construction, maintenance and working of slides and booms; the construction and maintenance of inter-provincial bridges and approaches thereto, and of bridges on highways of federal importance in the North-west Territories and the maintenance of military roads; also hydrographic and ordinary surveys and examinations, inclusive of precision levelling and geodetic measurements which are required for the preparation of plans, reports and estimates; the testing of cements, &c.

I have the honour to be, sir,

Your obedient servant,

EUG. D. LAFLEUR,

*Acting Chief Engineer.*



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During the fiscal year 1902-03, surveys, examination or inspections were made at the following places :—

## NOVA SCOTIA.

Amaguadus Pond, Cape Breton County.	Margaretville, Annapolis County.
Abraham River, Yarmouth County.	McKay's Point, Victoria County.
Annapolis, Annapolis County.	McNair's Cove, Antigonish County.
Baddeck, Victoria County.	Melbourne, Yarmouth County.
Baxter Harbour, King's County.	Meteghan, Digby County.
Bayfield Breakwater, Antigonish County.	Meteghan River, Digby County.
Bear River, Annapolis County.	Middle East Pubnico, Yarmouth County.
Beaver River, Digby County.	Middle River, Victoria County.
Benoit Cove, Antigonish County.	Musquodoboit, Halifax County.
Big Harbour, Victoria County.	Necum Teuch, Halifax County.
Boularderie Centre, Victoria County.	North River, Victoria County.
Breton Cove, Victoria County.	Ogden's Pond, Antigonish County.
Burlington, Hants County.	Parker's Cove, Annapolis County.
Canada Creek, King's County.	Pembroke, Yarmouth County.
Cape Cove, Digby County.	Pereaux, King's County.
Caribou Island, Pictou County.	Pictou Harbour, Pictou County.
Chebogue Harbour, Yarmouth County.	Pictou Light Beach, Pictou County.
Chegoggin, Yarmouth County.	Pipers Cove, Cape Breton County.
Cheticamp Harbour, Inverness County.	Plymouth, Yarmouth County.
Cheverie, Hants County.	Porter's Lake, Halifax County.
Church Point, Digby County.	Port au Pique, Colchester County.
Colloden, Digby County.	Port George, Annapolis County.
Comeau's, Digby County.	Port Lorne, Annapolis County.
Comeau's Hill, Yarmouth County.	Port Maitland, Yarmouth County.
Comeauville, Digby County.	Port Shoreham, Guysboro County.
Cow Bay, Cape Breton County.	Prospect, Halifax County.
Cribbin's Point, Antigonish County.	Ragged Head, Guysboro County.
Descousse, Richmond County.	Rocky Bay, Richmond County.
Digby, Digby County.	Sandy Cove, Digby County.
Eastern Passage, Halifax County.	Sandford, Yarmouth County.
Economy, Colchester County.	Scott's Bay, King's County.
Eel Brook, Yarmouth County.	Sheet Harbour, Halifax County.
Eel Cove, Victoria County.	Short Beach, Yarmouth County.
Finlay Point, Inverness County.	Sluice Point, Yarmouth County.
Five Islands, Colchester County.	Sober Island, Halifax County.
Folly Village, Colchester County.	Soldier's Cove, Richmond County.
Grand Narrows, Cape Breton County.	South Cove, Victoria County.
Grand River, Richmond County.	South Gut, Victoria County.
Granville Centre, Annapolis County.	South Maitland, Hants County.
Hampton, Annapolis County.	Spry Bay, Halifax County.
Harbourville, King's County.	Stony Island, Yarmouth County.
Hantsport, Hants County.	Tracadie, Antigonish County.
Herring Cove, Halifax County.	Three Fathom Harbour, Halifax County.
Hubbard's Point, Yarmouth County.	Tiverton, Digby County.
Iona, Victoria County.	Tusket, Yarmouth County.
Kelly's Cove, Yarmouth County.	Victoria, King's County.
Ketch Harbour, Halifax County.	Victoria Beach, Annapolis County.
Kingsport, Kings County.	Wedge Point, Yarmouth County.
L'Archevêque, Richmond County.	Wentworth, Hants County.
Little River Harbour, Yarmouth County.	West Arichat, Richmond County.



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Livingston's Cove, Antigonish County.	West Bay (south), Richmond County.
Liverpool, Queen's County.	West Chezzetcook, Halifax County.
Lower East Jeddore, Halifax County.	White Water, King's County.
Lower West Pubnico, Yarmouth County.	Windsor, Hants County.
Lower Washabuck, Victoria County.	Wolfville, King's County.
Maitland, Hants County.	Yarmouth Bar, Yarmouth County.
Malignant Cove, Antigonish County.	

## PRINCE EDWARD ISLAND.

Amherst Head, Prince County.	Montague River, King's County.
Bay Fortune, King's County.	Miminigash Harbour, Prince County.
Belfast, Queen's County.	Prim Island, Queen's County.
Blooming Point, Queen's County.	Pownal Bay, Queen's County.
Brooks Pond, King's County.	Panmure Island, King's County.
Beach Point, King's County.	Rustico Harbour, Queen's County.
Campbell's Cove, King's County.	Richmond Bay, Prince County.
Canoe Cove, Queen's County.	Sturgeon Pier, King's County.
Cove Head, Queen's County.	St. Mary's Bay, King's County.
Cascumpec, Prince County.	St. Andrews Point, King's County.
French River, Queen's County.	Victoria Pier, Queen's County.
Higgins Shore, Prince County.	Vernon River, Queen's County.
Morell River, King's County.	West Point, Prince County.
Morrisons Beach, King's County.	Wood Islands, Queen's County.

## NEW BRUNSWICK.

Anderson's Hollow, Albert County.	Long Wharf, St. John County.
Back Bay, Charlotte County.	Lord's Cove, Charlotte County.
Bathurst, Gloucester County.	Lower Newcastle, Northumberland County.
Bay du Vin, Northumberland County.	Middle Southampton, York County.
Belliveau, Westmoreland County.	Miramichi River, Northumberland County.
Belyea's Cove, Queen's County.	Miscou, Gloucester County.
Black Brook, Northumberland County.	Mispec, St. John County.
Black River, St. John County.	Mizonette, Gloucester County.
Brown's Flats, St. John County.	Moss Glen, King's County.
Buctouche, Kent County.	Negro Point, St. John County.
Burnt Church, Northumberland County.	Neguac, Northumberland County.
Campbellton, Restigouche County.	Oak Point, Northumberland County.
Cape Tormentine, Westmoreland County.	Oromocto, Sunbury County.
Caraquet, Gloucester County.	Partridge Island, St. John County.
Chockfish, Kent County.	Plaster Rock, Victoria County.
Clifton, King's County.	Point du Chêne, Westmoreland County.
Cole's Point, Westmoreland County.	Point Wolfe, Albert County.
Dalhousie, Restigouche County.	Quaco, St. John County.
Dunham, King's County.	Quaco West, St. John County.
Edgett's Landing, Albert County.	Red Store, Charlotte County.
Evandale, King's County.	Reid's Point, King's County.
Flewellings, King's County.	Richibucto, Kent County.
Fort Dufferin, St. John County.	Shippegan, Gloucester County.
Gagetown, Queen's County.	St. Andrews, Charlotte County.
Gardiner's Creek, St. John County.	St. George, Charlotte County.
Grand Anse, Gloucester County.	St. John Harbour, St. John County.
Grimross Canal, Queen's County.	St. Louis, Kent County.
Harvey, Albert County.	St. Mary's, Kent County.
Hatfield Point, King's County.	Stonehaven, Gloucester County.
Herring Cove, Albert County.	Tynemouth Creek, St. John County.
Holderville, King's County.	Upper Gagetown, Queen's County.
Hopewell Cape, Albert County.	Upper Salmon River, Albert County.
Jenkin's Cove, King's County.	Westfield, King's County.



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Lameque, Gloucester County.  
 Little Salmon River, St. John County.  
 Long Point, King's County.

Whickham's, Queen's County.  
 Wilson's Beach, Charlotte County.

## QUEBEC.

Anse à Grosse Roche, Saguenay County.  
 Canton Fabre (Témiscamingue).  
 Cap Rouge, Quebec County.  
 Chambord (Lake St. John).  
 Contrecoeur, Chambly County.  
 Deschambault, Portneuf County.  
 Desjardins, Pontiac County.  
 Discharge of Lake St. John.  
 East Templeton, Wright County.  
 Grondines, Portneuf County.  
 Les Escoumains, Saguenay County.  
 Mattagami River Route, Hudson Bay.  
 Mistook, Chicoutimi County.  
 Péribonka River, Chicoutimi County.  
 Portage du Fort, Pontiac County.

Portneuf, Portneuf County.  
 Quebec Harbour.  
 Rivière des Prairies, Laval County.  
 Rivière Jésus, Laval County.  
 Rivière du Lièvre, Labelle County.  
 Rimouski, Rimouski County.  
 River Saguenay, Chicoutimi County.  
 Roberval, Chicoutimi County.  
 St. François I. O., Montmorency County.  
 St. Gédéon, Chicoutimi County.  
 St. Jean des Chaillons, Lotbinière County.  
 St. Jérôme, Chicoutimi County.  
 Tadousac, Saguenay County.  
 Varennes, Chambly County.

## ONTARIO.

Algoma, Algoma County.  
 Amherstburg, Essex County.  
 Barrie, Simcoe County.  
 Barry's Bay, Renfrew County.  
 Blind River, Algoma County.  
 Bracebridge, Ontario County.  
 Colborne Harbour, Northumberland County.  
 Cumberland, Russell County.  
 Gananoque, Leeds County.  
 Gore's Landing, Northumberland County.  
 Grand River Bridge, Haldimand County.  
 Hiawatha Landing, Peterboro County.  
 Huntsville, Muskoka County.  
 Jones Creek, Leeds County.  
 Jordan Harbour, Lincoln County.  
 Kincardine, Bruce County.  
 Meaford, Grey County.  
 Midland, Midland County.  
 Orillia, Simcoe County.

Owen Sound, Grey County.  
 Pembroke, Renfrew County.  
 Peninsula, Algoma County.  
 Point Edward, Lambton County.  
 Point Traverse, Prince Edward County.  
 Port Burwell, Elgin County.  
 Port Perry, Ontario County.  
 River aux Canards.  
 River St. Lawrence, Kingston to Prescott.  
 Rosedale, Victoria County.  
 Sarnia, Lambton County.  
 Sault Ste. Marie, Algoma County.  
 Scugog River, Ontario County.  
 Spanish River, Algoma County.  
 Sydenham River, Bothwell County.  
 Thessalon, Algoma County.  
 Toronto Harbour.  
 Trenton, Hastings County.  
 Wiarton, Bruce County.

## MANITOBA.

Meadow Portage.

## BRITISH COLUMBIA.

Columbia River, vicinity of Spellamacheen and Galena.



## PROVINCE OF NOVA SCOTIA

## AMAGUADEUS POND.

Amaguadus Pond, Cape Breton county, lies on the northern side of East Bay, the eastern arm of the Great Bras d'Or lake, and is distant about 3 miles from Benecadie Point, at the entrance to and 16 miles from the head of the bay.

It is a large sheet of water, about 1 mile in length and  $\frac{1}{4}$  of a mile in width, with a depth of from 2 to 4 fathoms, separated from the bay by a beach of gravel overlying clay, of from 100 to 200 feet in width, and about 4 feet high above the summer level of the lake. The outlet is at the eastern end of the beach, but as it is open only for short periods after freshets, and then is available to small boats only, the pond is not of any practical benefit to the inhabitants.

The sum of \$2,000 was appropriated for expenditure, during 1902-3, towards the construction of a wharf. The site selected is on the outside of the beach, about 600 feet from its eastern end. The proposed work is to consist of blocks with intervening spans, and extend to 11 feet at low lake level; it will be 128 feet in length and 20 feet wide, with an L on the eastern side of the outer end, 20 by 20 feet, constructed of round timber, with creosoted timber substructure with outer faces of outer blocks close-sheathed, and its cost is estimated at \$4,000.

Of the amount voted the sum of \$485.60 was expended during the fiscal year in procuring the most of the materials required in the construction of the wharf.

## ARISAIG.

Arisaig, Antigonish county, is on the southern shore of the Northumberland strait, about 15 miles to the eastward of Merigomish, the nearest harbour.

The pier built by the provincial government, prior to Confederation, came under the charge of the federal government in 1870. It consisted of an approach 245 feet in length, and an outer portion 174 feet in length, varying from 40 to 44 feet in width. The approach is constructed with stone retaining walls filled in with stone, brush and clay, and the outer portion is of squared native timber crib-work, sheathed on the outer faces.

Repairs and improvements were made from time to time, including the construction, during 1889-91, of a squared native timber extension, 100 feet in length. In 1896-97-98 the seaward face of the pier was strengthened and a block, 24 by 24 feet, built of native squared timber, was placed on the seaward face of the outer end to strengthen the facework, and to secure and retain a proposed extension of the stone talus, in which some 250 cubic yards of large stone were placed.

In 1898-99 the stone talus along the seaward face of the pier was completed by placing 482 cubic yards of large stone, and some covering and fenders were renewed.

During the severe north-west gale of September 12, 1900, the work suffered slight damage, and the sum of \$292.18 was expended in reconstructing the top of the roadway on the approach for a distance of 75 feet, and to an average depth of 2 feet; in replacing 40 pieces of plank covering, 100 lineal feet of centre curbing over the covering, 75 lineal feet of cap-timbers and 35 pieces of sheathing, and in raising the talus by depositing 50 cubic yards of large stone upon it.

The outer end of the work built by the local government, for a distance of 105 feet, has been in a bad condition for some years. Temporary repairs have been effected from time to time, but as the timber is old and decayed and does not hold the fastenings, it



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has been found advisable to renew the top down to low water mark, and to reconstruct it with new materials, and the sum of \$900 was appropriated for expenditure during 1902-3 towards that purpose. Of the amount appropriated the sum of \$899.81 was expended in reconstructing a portion of the inner face of the outer end of the block, 49 feet in length, 20 feet wide, and to an average depth of 10 feet; in renewing 30 pieces of sheathing and 65 lineal feet of cap, and in procuring some of the materials required for the reconstruction of the balance of the old block.

The depth of water at the outer end of the pier, at low water spring tides, is 10 feet. Spring tides rise 5 feet.

Total expenditure to June 30, 1903, including refund of \$541.41 to provincial government, is \$35,928.88.

#### BAILEY'S BROOK.

Bailey's Brook, Lismore, Pictou county, is a large stream emptying into the Strait of Northumberland at a point about 10 miles to the eastward of the entrance to Merigomish harbour, and 6 miles to the westward of Arisaig.

This brook brings down during freshets a large volume of water to the sea, but in the summer season it runs nearly dry, and its mouth becomes obstructed by sand cast up by the sea during easterly winds. In the last  $\frac{1}{2}$  mile of its course it flows through alluvial soil in a channel of from 50 to 80 feet in width, with a depth of about 3 feet at low water springs.

The sum of \$2,000 was voted for expenditure during 1902-3 towards the opening of a permanent channel through the beach, to permit boats to enter the mouth of the brook for shelter, and for the construction of channel protection works on the outside.

The works proposed to effect the improvements are estimated to cost \$5,000, and consist in cutting a channel through the beach, about 290 feet in length and 30 feet wide in the bottom, with a depth of 2 feet at low water springs, or  $6\frac{1}{2}$  feet at high water; the construction of a shear dam on the western side of the channel 130 feet in length and 12 feet wide, founded at low water, and protected with sheet-piling on the channel face and outer end; and the construction of a breakwater, 240 feet in length and 20 feet wide on top, extending out into 3 feet at low water, and constructed of round timber cribwork, off the beach, 30 feet to the eastward of the channel, to prevent the sand from closing it, and to serve at the same time as a boat landing.

The amount appropriated by Parliament at the session of 1902 was expended during the fiscal year 1902-3 in procuring most of the timber required for the construction of the protection works.

#### BASS RIVER.

Bass River, Colchester county, is a farming and manufacturing village of about 500 people, situated on the north side of Cobequid bay, the eastern arm of the Bay of Fundy. It is half way between Truro and Parrsboro, or about 28 miles from each place. In 1894-95 the department built, by contract, at a cost of \$3,240, a public wharf of pilework, 210 feet long, 40 feet wide, with an L at the outer end 55 feet long and 40 feet wide. At the outer end of the L it was found necessary to build a small block of cribwork, containing 8,000 cubic feet, on account of the hard nature of the bottom preventing the piles from being driven to their proper depth. Along its outer face the work is 26 feet high, giving a depth of 22 feet at H.W.O.S.T.

In the fiscal year 1901-02 the department expended the sum of \$1,099.11 in extending the pile-wharf built in 1894-5. The extension is 40 feet square, substantially built of pilework, and giving the wharf the form of a T. A small freight shed was also built on the wharf for the accommodation of local shippers and merchants.



## SESSIONAL PAPER No. 19

In 1902-3 the sum of \$56.06 was expended in enlarging the freight shed on the wharf.

## BEAR RIVER.

The village of Bear River, situated at the head of navigation, 5 miles above the two bridges, highway and railway, which are near the mouth of the river, is an important and prosperous settlement, partly in Annapolis and partly in Digby county, the river forming the boundary between the two counties. Large quantities of piles, cordwood and lumber are annually shipped to South America, the West Indies and the United States, and the volume of shipping may be judged by the fact that the bridges, in each of which there is a swing span, are opened from 300 to 400 times in each year for the passage of vessels.

In 1901-2 the sum of \$3,000 was expended in removing the upper portion of an old pier of the highway bridge, which was rebuilt by the provincial government about 12 years ago, on a site about 100 feet further up stream. This old pier bottom, which was removed to a depth of 5 feet below low water, spring tides, was so close to the channel that it was a source of danger to vessels passing up and down. The dropping pier, on the down stream side of the swing span of the highway bridge, was also rebuilt in substantial pilework, the new pier being 180 feet long, 25 feet wide, and from 20 to 30 feet high, strongly built of pile bents, well braced, fendered and bolted, provided with mooring posts and rings, and with three rows of hardwood walings on the river face. Of the total expenditure of \$3,000, the sum of \$349.17 was expended in the purchase of piles and timber for the rebuilding of the dropping pier on the upper side of the highway bridge.

In 1902-3 the sum of \$1,611.35 was expended in rebuilding the dropping pier on the up-stream side of the Victoria highway bridge. The work consists of a piece of well and strongly built pile wharfing, 180 feet long, 16 to 27 feet wide and 18 to 25 feet high, covering the site of the old dropping pier, which was so far decayed and eaten away by the limnoria as to be no longer safe or serviceable.

The total expenditure by the department up to June 30, 1903, is \$4,612.35. Spring tides rise 27 feet.

## BIG POND.

Big Pond, Cape Breton county, is on the south side of East Bay, an arm of the Great Bras d'Or lake, about 13 miles from the head of the bay, and 25 miles from the town of Sydney.

Big Pond is so called on account of the existence here of a large sheet of water, separated from the bay by a beach.

During 1874-75 a cutting was made through the beach, from the bay into the pond, and its sides protected with cribwork, but there being no large streams discharging into the pond the slight rise and fall of the tide (about 1 foot) did not produce sufficient scour to keep the opening clear, and it soon filled up with sand.

A block and span wharf, 260 feet in length, was constructed during 1887-88-89, but being built of native timber, in a few years it was destroyed by the teredo; the outer end was carried away by ice, and it was decided to abandon it.

In 1899 a report was submitted on the construction of a new wharf. Two sites were examined and estimates were attached for the cost of the wharf on each site; but owing to diversity of opinions the site for the new wharf was not decided upon until January, 1903.

On January 13, 1903, instructions were received to prepare plans and specification for the construction of a wharf on the eastern site, and they were submitted on March 27.



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Tenders for the construction of this wharf were asked for in May, 1903, but up to the end of the fiscal year the work had not been let.

The only expenditure was that incurred in calling for tenders, and amounted to \$84.79.

## BROOKLYN.

Brooklyn, Queen's county, or Herring Cove, as this place was formerly called, is situate on the eastern side of Liverpool harbour. Owing to the existence of a sand bar, and the contracted shape of the harbour, this cove has proved to be the only safe anchorage in the bay, after being properly protected. In 1879, the department constructed a breakwater at this place which cost \$68,412.47, but for the last eight or nine years it has been of no practical utility. Owing to the presence of the teredo, the logs of the cribwork were eaten away and the entire structure became wrecked or practically so, and on account of the stone ballast having fallen out into the harbour, the old work became a menace to navigation, rather than a protection to shipping. About  $\frac{1}{2}$  mile to the eastward of this breakwater, lies a cove at the mouth of which, prior to Confederation, the provincial government of Nova Scotia had constructed a wharf, which was permitted to fall into a state of decay. In the year 1899-1900 the department began the construction of a new wharf upon the same site, which could only be completed in 1901-02, at a total cost of \$2,468.38. In 1900, the approach to this wharf was renewed and raised 3 feet, the old work, consisting of solid continuous cribwork, 158 feet long and 32 feet wide, was rebuilt for a height of 6 feet at the top. During 1901-2 the wharf was also extended 50 feet, the work being built of a uniform width of 32 feet wide and a height of 23 feet at the outer end. This extension was constructed of pile trestle bents, placed 10 feet centre to centre, well fendered, braced and waled and moreover close-piled along its head and seaward side. The traffic at this wharf having increased very much since it was rebuilt, a sum of \$556.09 was applied in 1902-03 in further enlarging the structure, and thus providing additional berth-room. The wharf was widened at the head by 24 feet for a length of 32 feet from the outside face shorewards. This lateral enlargement consists of pile trestle-bents, placed 8 feet apart, centre to centre, well braced, waled and fendered. It is believed the wharf will now accommodate all the shipping that is likely to call at this place, as it now has two good berths for vessels, one at its head and another on its inner side.

## BOULARDERIE CENTRE.

Boularderie Centre, Victoria county, is on the southern side of the Great Bras d'Or Channel, about 8 miles to the westward of its entrance into the Atlantic ocean, and 10 miles to the eastward of its entrance into the Little Bras d'Or lake.

On April 25, 1901, a contract was entered into for the construction of a wharf, which was completed on June 30, 1902.

The wharf is 164 feet in length and 20 feet in width, with an L at the outer end, 200 feet by 20 feet, and consists of an approach of stone, clay and gravel, 10 feet long, of a crib abutment, 30 feet long; of two crib-work blocks 20 by 20 feet, and of an outer block 24 by 40 feet, with 20 feet openings between the blocks, spanned and covered over. The abutment and the blocks constructed of round timber, are creosoted up to high water, protected all around with fenders, and the faces of the two outer blocks with close sheathing.

The depth at low water along the channel face is 13 feet, spring tides rise 2 feet.

During the last fiscal year the sum of \$2,499.79 was expended in opening a road, passable for teams, from the wharf to the highway, a distance of 2,100 feet, and for payments due on the work done by contract during the previous year.

The total expenditure on this work to June 30, 1903, is \$5,524.61.



## SESSIONAL PAPER No. 19

## BURLINGTON.

Burlington, Hants county, with a population of about 350 people, is a farming settlement five miles north of the county town of Windsor, on the right bank of the mouth of Kennetcook river.

In 1901-02, the department expended the sum of \$3,499.99 in constructing a public wharf for general shipping purposes. The work, which is built of blocks and spans, is 222 feet long and 25 feet wide. In the whole work there are nine blocks, from 11 to 20 feet long in stem of wharf, and from 6 to 27 feet in height. The spans, which have a uniform length of 13 feet, are 8 in number. The outer end of the work which, including the L, has a face length of 59 feet, is 25 feet high, and at L. W. O. S. T. has a depth of 23 feet of water.

In 1902-3, the sum of \$1,590.79 was expended in completing the road approach, in building a small freight shed on the wharf, and in filling with solid cribwork the four outer spans, it having been found that southerly winds drove the sea through the openings, causing vessels alongside to strike heavily against the wharf. Spring tides rise 40 feet, neaps 36 feet.

The total expenditure to June 30, 1903, is \$5,090.58.

## CANADA CREEK.

Canada Creek, King's county, also called Black Rock, is a small fishing and farming village of about 150 people, on the south shore of the Bay of Fundy, 60 miles east of Digby Gut, and 8 miles west of Hall's Harbour. The harbour is formed by two piers or breakwaters, built one on either side of a small stream. That on the east side, which is entirely detached from the shore, serves merely as a breakwater, and was built by the department in 1878-9 at a cost of \$3,000. It is 150 feet long, 25 feet wide on top, and from 12 to 15 feet high, substantially built of round log cribwork, close-faced, well ballasted and fendered. The breakwater on the western side, ordinarily 248 feet long, which serves both as a breakwater and landing pier, was built before Confederation at the joint expense of the inhabitants and the provincial government. It is built of round log cribwork, the seaward side being protected by close sheathing of flatted spars. In 1874 it was extensively repaired at a cost of \$2,500. In 1884 further repairs were made, and a new block 57 feet long by 10 wide was built on the seaward side of the shore end. In the winter of 1889-90 the outer 100 feet in length was completely wrecked, and other minor damage caused by severe gales. The shortening of the structure caused the gravel to wash around its end and fill up the berth for vessels in the bed of the stream along the eastern side. In 1892-3 the department built a new block of cribwork on the outer end of the old work, 50 feet long, 14 feet wide on top, and from 8 to 11 feet high between the outer end of the existing work and the remains of the old. The block was totally destroyed in November, 1899. In 1900-1 an expenditure of \$1,928.09 was made in repairing the work and in building a new block 34 feet long, 30 feet wide, and at the outer end 28 feet in extreme height.

In 1901-2 the sum of \$1,205.18 was expended in completing the new block, in extending the main breakwater, begun the previous year, and in taking down and rebuilding a length of 60 feet of the retaining wall on the east side of the mouth of the creek, this piece of work being of an average height of 10 feet and width of about 12 feet.

In 1902-3 the sum of \$499.96 was expended in thorough repairs to the outer end of the eastern breakwater, which was in a dilapidated condition and endangering the whole structure.

Total expenditure to June 30, 1903, including refund of \$550 to the provincial government, is \$13,519.02.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.



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## CAPE AUGET.

Cape Auget, Richmond county, is the southern promontory of Madame island, and separates the harbour of Arichat from Petit de Grat Inlet, and forms the south-eastern side of Arichat harbour.

The sum of \$500 was voted for expenditure during 1901-2 on a boat harbour at Herbine's Cove, on the north-western side of the cape, and about 1 mile to the eastward of Marache Point, on the east side of the southern entrance into Arichat harbour.

The cove is from 100 to 150 feet in width, and about 600 feet in length (at high water), and is formed by an outlying island, connected on its southern end with the mainland by a narrow gravel and shingle beach. The entrance is from the north-east through a narrow channel obstructed by a bar, nearly dry at low water.

Out of the amount appropriated the sum of \$495.67 was expended in the construction of a small breakwater, 40 feet long, 16 feet wide, and extending out to low water, on the western side of the cove, and in improving by hand dredging the channel leading into it.

During the fiscal year 1902-3 the sum of \$912.83 was expended in the construction of an addition to the breakwater, 40 feet long, 20 feet wide, and extending out into 9 feet at low water. Spring tides rise 5 feet.

Both sections of the work were constructed of round native timber, laid open-faced, properly fendered and filled in solidly with ballast to the top, which is not covered in, but levelled off with large flat stones.

Total expenditure to June 30, 1903, is \$1,408.50.

## CAPE COVE.

Cape Cove, or Cape St. Mary, Digby county, is situated on the east coast of the mouth of the Bay of Fundy, near the entrance of St. Mary's bay. It is 19 miles north of Yarmouth, and 27 south of Weymouth. It has a population of about 150 people, engaged chiefly in fishing; it is one of the best fishing stations on the coast of St. Mary's bay, cod, haddock and herring being caught in great abundance.

A breakwater for the protection of the fishing fleet was begun about the year 1840, and built in sections by the inhabitants, aided from time to time by small grants, amounting in all to \$1,200 from the provincial government. In 1881-3, the department expended \$4,499.47 in making extensive repairs and renewals, part of the work under these appropriations being the construction of a buttress built of round-log crib-work, 50 feet long and 15 feet wide to support the middle of the southern face of the work, where a breach had been made by the eating away of the face logs by the limnoria and the action of heavy seas. The work is 300 feet long, 25 feet wide on top, and 24 feet high at the outer end. In 1900-1, the sum of \$750 was expended in rebuilding a gap in the middle of the work that had been made by the storm of March 1, 1900.

In 1901-2, the sum of \$3,999.97 was expended in building a new block in extension of the old breakwater, 30 feet long by 34 feet wide, and also in building a re-enforcing block on the western or seaward side, 121 feet long, 10 feet wide and from 17 to 24 feet high. The outer new block is from 24 to 26 feet high. A new top was also built on the old work for the whole of the 121 feet widened by the new block.

In 1902-3, the sum of \$3,000 was expended in extensive repairs to the breakwater. The seaward side of the shore end for a length of 135 feet and width of 12 feet, and for a height of 7 to 18 feet, was taken down and thoroughly rebuilt, and the whole seaward face of the outer end was close-sheathed.

Spring tides rise 18 feet, neaps about 15 feet.

The total expenditure to June 30, 1903, is \$14,618.83, including a refund to the provincial government of \$1,304.38 in 1887-88.



## SESSIONAL PAPER No. 19

## CAREY'S PASSAGE.

Carey's Passage, Richmond county, is situated on the northern side of the western entrance into Lennox Passage, and connects it with the basin of River Inhabitants.

Owing to the existence of a gravel beach across the channel, near its entrance into the basin, fishing boats could only use the passage during high water, and in consequence the fishermen lost much time and suffered many inconveniences.

In 1901-2, out of the amount voted for rendering the passage available for boats at all times of tide, the sum of \$807.04 was expended in cutting a channel through the beach and in deepening the old channel, for a distance of 400 feet, to low water, and in the construction of a cribwork channel protection, 80 feet long and 10 feet wide, on the eastern side of the cut through the beach.

During the fiscal year ended June 30, 1903, the sum of \$999.90 was expended in completing the work commenced during the previous year. The channel is 950 feet in length and 16 feet wide in the bottom, and carries a depth of 2 feet at low and 8 feet at high water springs, and the channel protection works at the inner end of the channel are 107 feet long and 10 feet wide on the eastern, and 68 feet long on the western side.

The work has proved of great benefit to the fishermen of the district.

Total cost of the works is \$1,806.94.

## CARIBOU ISLAND.

Caribou island, Pictou county, is on the Northumberland strait, 5 miles to the westward of the entrance to Pictou harbour.

Caribou harbour, sheltered by Caribou island and a smaller island lying to the eastward of it, is 6 miles in length and 1 mile in average width. The principal entrance, between the two islands, has a depth of only 4 feet at extreme low water, and the flats between the mainland and the western extremity of Caribou island are dry at extreme low water, except in a few small channels. Spring tides rise 6 feet, neaps 4 feet.

A causeway of brush and stone, 1,330 feet in length and 18 feet in width, between the mainland and the western extremity of the island, commenced in 1890-91, was, after the completion of work undertaken in 1894-95, built up to the level of the ordinary high water over 560 feet of its length, and about  $1\frac{1}{2}$  feet below that level over the remaining 770 feet. In 1897 a breach was made through the work near its western extremity, where the bottom was scoured to a depth of about 4 feet at low water, and the top of the low portion, 560 to 1,300 feet from the west end, was disturbed in places. In 1900-1 and 1901-2 the breaches in the brush and stonework were filled in and the work raised to about the level of the ordinary high water.

During the fiscal year 1902-3 the sum of \$650.06 was expended in continuing the raising of the brush and stonework, which was brought up to an average height of about  $1\frac{1}{2}$  feet above extreme high water.

Total expenditure to June 30, 1903, is \$3,802.47.

## CHARLESVILLE.

Charlesville, Shelburne county, is a small village of about 300 inhabitants, the chief livelihood of whom results from the pursuit of the fishing industry. It is situated 5 miles south of the head of Pubnico and 10 miles west of Barrington, at almost the extreme south-eastern part of Pubnico harbour. The place being exposed to the heavy southerly gales, which are the strongest winds felt in this vicinity, previous to the construction of the government pier no protection whatever was afforded these fishermen, who are engaged altogether in the lobster fishery with small boats during the first five and the last month of the year, when they have almost all the heavy weather to contend with. Besides this inconvenience they moreover have had no landing facilities



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for their supplies without trucking a distance of from  $1\frac{1}{2}$  to 3 miles, which greatly enhanced the cost of these articles. During the fiscal year 1902-3 a breakwater and wharf combined was built at this place, which serves both these purposes, at a total cost of \$2,700.20. This breakwater is built at the southern end of a small cove immediately inside a reef by which it is partly protected, the work being most substantial. It has a total length of 261 feet, comprising a rock-bank approach 46 feet long and 215 feet in length of continuous, round-log, stone-filled and well fendered and fastened cribwork with a top covering of 3-inch plank. It is 20 feet wide on top throughout, and has a height of 21 feet at the outer end, where there is a depth of 7 feet at low water ordinary spring tide. It is believed the structure will meet the requirements of this locality, and prove to be of great value and assistance to the fishermen.

## CHEGGOGIN.

Cheggogin, Yarmouth county, is a small fishing and farming village, with a population of a couple of hundred people, situated on the Bay of Fundy coast, about 5 miles north of Yarmouth. The little bay of the same name is  $\frac{1}{3}$  of a mile deep north and south, and about the same width east and west, fully exposed to the south-west but sheltered from every other quarter. It is dry at low tide, but at high water has a depth of from 12 to 14 feet.

Over half a century ago a breakwater was built by the proprietors of the marsh in a position immediately west of the present work. It was totally destroyed about 20 years ago, not a vestige of it being visible to-day.

In the winter of 1895-6 the inhabitants, aided by a grant of \$45 from the municipal council, built a small breakwater 80 feet long,  $12\frac{1}{2}$  feet wide, and from 6 to 11 feet high, on the south side of the stream's outlet. In 1899-1900 the sum of \$598.12 was expended in lengthening the breakwater by the addition of a new block 60 feet long, 15 feet wide, and from 10 to 13 feet high. It is cheaply but substantially built of round-log cribwork of the usual type.

In 1900-1 the breakwater was further extended a length of 51 feet, at a cost of \$692.21. The new block is 11 feet wide on top, with side batters of 1 in 12, and from 12 to 13 feet high. In addition to the extension, a piece of the shoreward end of the work was rebuilt, 30 feet long, 8 feet wide, and from 7 to 9 feet high, at a cost of \$88.03.

In 1902-3 the sum of \$76.58 was expended in raising the shore end of the breakwater a height of from 2 to 3 feet, for the purpose of preventing the gravel and sand from washing over and filling up the mouth of the stream where the fishermen keep their boats.

Spring tides rise 16 feet, neaps 13 feet.

Total expenditure to June 30, 1903, is \$1,454.94.

## CHETICAMP POINT.

Cheticamp Point, Inverness county, is the southern extremity of Cheticamp island, about 1 mile to the eastward of a beach of shingle closing the south end of Cheticamp harbour, which lies between the island and the mainland, and is entered from the north.

During the year 1902-3, tenders were invited for the construction of a breakwater 370 feet in length, but up to its closing a contract had not been entered into.

The expenditure incurred in calling for tenders was \$123.38.

## CHEVERIE.

The village of Cheverie, Hants county, with a population of about 350, is situated on the right or east bank of the estuary of the River Avon, where it debouches into the Basin of Minas, some fifteen miles north of Windsor, the county town. It is a good farming district, but the principal trade of the place is in the quarrying and



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shipment of gypsum to the United States. The quantity, which varies according to the prices ruling in the American market, ranges from 20,000 to 60,000 tons per annum. A wharf, about 100 feet long, was built here many years ago by the provincial government. In 1873-74 the Department of Public Works lengthened it 70 feet, at a cost of \$2,338.88, this extension being of open round log cribwork, like the old work. In 1882 a further extension of 182 feet was built at a cost of \$5,000. This piece of work is of square timber, close-faced, 25 feet high and 25 feet wide on top, the same width as the former, and the sides batter 1 in 12. In 1885 the sum of \$600 was expended in effecting some much needed repairs to the shoreward side of the wharf. In 1884 the department built a detached breakwater 300 feet distant from the outer end of the wharf for the purpose of protecting the latter from northerly seas, to which it was exposed. This piece of work consists of solid cribwork 130 feet long, 20 feet wide on top, 35 feet wide at base and about 23 feet high, built of square timber and close-faced on all sides. The seaward side to a height of 10 feet below high water of spring tides has a slope of 1 to 1, the sloping faces being covered with 6-inch plank. The block is provided with mooring posts to assist vessels coming to a berth at the wharf, as well as with ring bolts and ladders. In 1887-88 the sum of \$500, and in 1896-97 the sum of \$100, was expended on extensive repairs. On the outer 100 feet in length the flooring, guards and some of the fenders were renewed; on the next 80 feet the guards and a few fenders were renewed; on the next 105 feet the work received new ties, stringers, guards, flooring and fenders; on the next 50 feet shorewards most of the flooring was renewed. 205 feet in length of the wharf included in the above lengths was raised in height from 1 to 3 feet. In all, 69 new fenders were placed and 250 tons of new ballast was put in.

In the fiscal year ended June 30, 1902, the sum of \$768.23 was expended in the purchase of timber for the extension of the detached breakwater built in 1884 as described above.

In 1902-03 the sum of \$2,999.34 was expended in the construction of an extension to the detached breakwater. The new block is 100 feet long, 23 feet wide on top, 22 feet high, battering on the landward side 1 in 4 and plumb on the seaward face, with a break 5 feet high. It is substantially built of stone-filled cribwork, and close sheathed on the seaward side.

At the end of June, 1903, the work was completed to within 4 or 5 feet of the top.

## CHURCH POINT.

Church Point, Digby county, is situated on the south-east side of St. Mary's Bay, 6 miles south-west from Weymouth. It has a population of 200 people, engaged in farming and fishing.

The work, which consists of a wharf, a retaining wall and a breakwater, appear to have been built between the years 1856 and 1866, at the joint expense of the provincial government and the inhabitants, the expenditure of the government having been \$61,055.66.

In 1875-6 the department expended the sum of \$2,000, the inhabitants contributing an equal amount, in repairing the northern face and in building an L, 72 feet long by 20 feet wide at right angles to it, with the object of preventing gravel from working around the outer end. The movement of gravel, which is from south to north, has always been more or less a difficulty and detriment to this port. In 1890-1, the gravel having worked around the outer end of the breakwater and formed a bar across the entrance to the loading berth, a small groyne, 40 feet long and 24 feet wide, was built, projecting at right angles from the outer or north-west corner of the breakwater. The groyne was extended in 1894-5 a further distance of 30 feet, and in 1896-7 it was again extended by a length of 120 feet and width of 16 to 25 feet by a height of 10 to 22 feet, all of round log cribwork. The sluice gates at the head of



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the dock, where the fresh water stream makes its exit, were rebuilt in order to cause the stream to scour away the gravel from alongside the wharf front.

In 1900-1 the sum of \$800 was expended in rebuilding 63 feet in length of the wharf front, 16 feet high and from 10 to 20 feet wide, 35 feet of this length being close-piled. The sluiceway was entirely rebuilt and fitted with double lifting gates instead of single; the floor of the sluice was lowered 5 feet, and an apron, extending 13 feet up stream and 50 feet down stream, was constructed of 3-inch plank, well spiked to heavy stringers, bedded in close packed stone, and close-piled at both ends to prevent scour.

In 1902-3 the sum of \$1,800 was expended in rebuilding 134 feet in length of the wharf wall. The new piece is 15 feet wide at bottom, 18 feet wide at top and 20 feet high, solidly built of stone filled cribwork.

The total expenditure to June 30, 1903, is \$12,357.81, including a refund of \$1,692, to the provincial government in 1887-8. This work was transferred to the control of the Department of Marine and Fisheries in June, 1888.

Spring tides rise about 22 feet.

#### COMEAU'S BROOK.

Comeau or Comeau's Brook, Digby county, is the name of a portion of that continuously settled district on the shore of St. Mary's bay, between Yarmouth and Weymouth. It is one mile north of Saulnierville, and six miles north of Meteghan river. Many years ago a breakwater had been constructed here, probably by private parties, but it was very inadequate and had been allowed to go to decay. During 1901-2, the department expended the sum of \$997.31 in repairs and renewals. The shoreward end of the old breakwater was rebuilt a length of 60 feet by 24 feet wide, by 10 to 12 feet high, in substantial round-log cribwork, well sheathed, fendered, ballasted and bolted, and with a break 4 feet high.

In 1902-3, the sum of \$1,202.37 was expended in extending the breakwater. The new extension is 30 feet long by 28½ feet wide and 15 feet high at the outer end. There was also built on the shore end a new block 30 feet long, 11 feet wide and from 7 to 9 feet high, to retain the approach. The whole of the new work has been substantially built of round-log cribwork, well fendered, ballasted and close sheathed.

The total expenditure to June 30, 1903, is \$2,192.62.

#### COMEAU'S HILL.

Comeau's Hill, Yarmouth county, is the name of a straggling settlement of some two or three hundred people, situated on the west side and close to the extremity of the peninsula between Chebogue harbour and Goose Bay, about fifteen miles south-west from Yarmouth, the county town. It is conveniently situated as regards the fishing industry of a considerable district, and is the headquarters of a fleet of some 40 boats.

In 1900-1, the department expended the sum of \$1,000 in building a breakwater, 135 feet long, 16 to 20 feet wide on top, and 12 feet high at the outer end. The whole work is constructed of granite boulders, the inner or harbour face being of split boulders laid with a smooth battered face of about 1 to 12, the outer or seaward face of round and irregular shaped rocks with a slope of 1½ to 2 in 1. The work, so far as it goes, answers its purpose admirably, and it is a permanent and satisfactory job.

In 1902-3, the sum of \$599.72 was expended in partially rebuilding the outer 50 feet in length of the breakwater, which had been damaged by an abnormally high tide and a north-west gale on November 24, 1901.

Spring tides rise 12 feet, neaps 10 feet.

Total expenditure to June 30, 1903, \$1,599.72.



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## COMEAUVILLE.

Comeauville, Digby county, is a straggling settlement of some 200 or 300 people, engaged in fishing and farming, situated on the eastern shore of the Bay of Fundy, 35 miles south-west of Digby, the county town.

The wharf, which was built many years ago, before Confederation, was partially or wholly destroyed about 1878, and thereafter abandoned by the department. During the next 10 or 15 years, it was partially repaired by private parties. It appears that at the time it was destroyed the inhabitants petitioned for a grant of \$4,000 to \$5,000 for the purpose of restoring the work, and the money was voted. Before the work was begun, however, Mr. Campbell, then federal member for the county, died, and the money was diverted to repairing the wharf at Little Brook, which the inhabitants seem to have called 'Comeauville' or 'Comeau,' for the purpose of deceiving the department and securing the appropriation; the departmental records show expenditures at 'Comeauville' of \$3,135.56 in 1887-8, but it is probable that these amounts were really spent at Little Brook.

In 1900-1, the sum of \$4,346.02 was expended in the renewal, repair and improvement of the work. A gap of 75 feet in length between the shore and the outer block was closed in solid cribwork to replace the old dilapidated work destroyed by the storm of March 1, 1900. This new block is from 20 to 24 feet in width, from 4 to 18 feet in height, thoroughly well and substantially built of round-log cribwork, filled solid with ballast and sheathed on the seaward side with 6-inch sawed spruce. On the seaward side also a break was erected 4 feet high. An extension to the breakwater was built, 37 feet long, 28 feet wide and from 20 to 22 feet high. This new block is strongly built of round-log cribwork of the usual type, close-sheathed on the seaward side and the outer end, well fendered and filled solid with ballast. In addition to this, the top of the old work for 57 feet shorewards was rebuilt to a height of 5 to 8 feet. The bottom of this portion was sound enough to carry a new top, while the upper part was much decayed and practically a wreck.

In 1901-02 the sum of \$2,000 was expended in restoring the shoreward portion of the breakwater, of which the outer end was built in 1900-01. The new work is 238 feet long, 25 feet wide by 14 to 19 feet high, thoroughly well built of round log cribwork, filled with ballast and well fendered and bolted.

In 1902-03 the sum of \$1,998.49 was expended in extending the breakwater by a new block, 40 feet long, 28 feet wide and from 22 to 28 feet high, substantially built of stone filled cribwork, close-sheathed on the seaward face and outer end.

Spring tides rise 21 feet, neaps 17 feet.

Total expenditure to June 30, 1903, \$11,484.65.

## COW BAY (PORT MORIEN).

Cow Bay (Port Morien), Cape Breton county, is on the eastern coast of Cape Breton island, about 18 miles to the eastward of the entrance to Sydney Harbour.

A breakwater, built by the owners of the Gowrie Coal Mine on the north side of the bay, came under the charge of the department in 1873. It originally extended 1,374 feet to 17 feet at low, or to 23 feet at high water, and was about 44 feet in width. The area of the basin inclosed between it and the shipping pier of the Gowrie mines, now the property of the Dominion Coal Company, was 17 acres, 10 acres of which had a depth of from 9 to 17 feet at low water.

The breakwater was seriously damaged during the great gale of August 24, 1873. Extensive repairs and improvements were made nearly every year up to 1895 when the breakwater consisted of 220 feet of old work protected on the seaward side by a beach of shingle and boulders. 360 feet of old work 44 feet in width, with a new inner face work and a break on the seaward side built over the remains of the old work; and 793 feet of inner work with counterforts and connecting outer face



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works. The inner and outer face works were from 30 to 20 feet apart; they were connected by tiewalls and the spaces were filled with earth and stone ballast.

In 1895 and 1896, 260 feet of breakwater (1,114 feet from the shore end outward) was carried away down to from 2 to  $6\frac{1}{2}$  feet below low water; the outer face works from 1,114 feet from the shore end inward were badly damaged, and ballast was washed over the works and deposited in the dock along the inner face from 581 feet to 1,114 feet from the shore end.

Between the years 1897 and 1901 a large amount was expended in repairing and strengthening the breakwater from 1,114 feet from the shore end inwards. The outer works were repaired and strengthened by filling in the face chambers to about half tide level with concrete and by close-piling; the stringers and covering of the inner work from 581 feet to 1,114 feet from the shore end were renewed, and the work of placing a talus of concrete blocks on the seaward side was commenced.

During the fiscal year 1902-3 the sum of \$10,005 was expended in repairing and strengthening the breakwater—the new work including the reconstruction of 87 feet of outer face work, 24 feet in width and 15 feet in average height, of which the outer face chambers were filled with concrete and the outer face close-piled; and in the reconstruction, to within 1 foot 4 inches of the top, of part of outer end, 49 feet in length, 24 feet in width and  $15\frac{1}{2}$  feet in average height, which remains to be completed and to have the outer face chambers filled with concrete and the outer faces close-piled.

Total expenditure to June 30, 1903, including \$25,000 for purchase of breakwater, is \$231,610.56.

#### CRIBBIN'S POINT.

Cribbin's Point, Antigonish county, is on the west side of St. George's bay, 8 miles to the southward of Cape George, and 5 miles to the northward of the entrance to Antigonish harbour.

The wharf, completed in 1892-3, extending 300 feet in a southerly direction from the point, has an approach 195 feet in length. It is 20 feet in width, for a distance of 120 feet from the inner end, and 30 feet for the remaining 180 feet; the inner 50 feet being of stone, and the outer 250 feet of close faced native timber cribwork, fully ballasted.

The face timbers having become weakened by the ravages of the teredo, during the years 1896-97-98-99, the outer end, the seaward face for a distance of 20 feet, and the inside face for a distance of 10 feet, from the outer end, were close-piled with creosoted timber; a talus of quarried stone was placed on the seaward side; the work was reballasted where necessary, and a timber 'break,' 100 feet in length and  $2\frac{1}{2}$  feet in height, above the cap timber, was constructed on the seaward side of the inner end of the wharf to prevent the sand from washing on to the work.

A sum of \$1,000 was appropriated for expenditure during 1899-1900, towards the construction of an extension, and the amount was expended in obtaining a portion of the creosoted timber required.

During 1900-1 the sum of \$3,079.98 was expended in procuring the balance of the timber required for the extension and in repairing the outer end of the old work, which was almost destroyed during the severe gales in the autumn of 1900. The repairs consisted in the reconstruction of the top for a distance of 60 feet and to a depth of 8 feet, and in placing heavy quarried stone in the talus on the seaward side of the reconstruction work.

As the sand at the end of the wharf, at which originally there were 11 feet of water, at low water, had made up to a height of about 6 feet since its completion, it was deemed advisable to found the extension on the original bottom, and for that purpose the dredge 'George McKenzie' was engaged from May 30 to July 12, 1900, in dredg-



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ing out the foundation for the new block and the approaches thereto, at a cost of \$1,604.44.

The total amount expended during 1901-2 was \$3,122.99, exclusive of dredging, and the extension was completed in accordance with plan and specification. The extension is 48 feet long and 20 feet wide on top, with outer faces sloping 1 in 10, and is placed across the end of the wharf, forming an L 18 feet long. It is of an average height of 20 feet, and is constructed of round timber, laid open-faced, with creosoted timber substructure, close-sheathed on all outer faces, and filled in solidly with ballast.

During the fiscal year ended June 30, 1903, the sum of \$1,357.87 was applied in raising and repairing the outer end of the old work, commencing at the inner end of work reconstructed during 1900-1, for a distance of 60 feet inwards a width of 30 feet, and for an average depth of 3 feet. New face timbers and floor timber break on the seaward side was extended outwards for a distance of 90 feet ( $2\frac{1}{2}$  feet high above the cap) ; the seaward face of the work was newly sheathed for a distance of 70 feet, the road approach was widened and improved, and the stone wall under the inner end of the wharf was repaired.

The total amount expended on this work, including dredging, is \$21,711.55.

## DESCOUSSE.

Descousse, Richmond county, is a thickly settled district on the north-eastern coast of Madame island, and on the southern side of the eastern entrance into Lennox Passage, a strait separating Madame from Cape Breton island, and connecting St. Peter's bay with the strait of Canso.

The harbour is formed by outlying islands and connecting beaches, and the entrance is from the eastward, through a narrow channel, obstructed by a 'bar' with 10 feet at low water. It is about  $\frac{3}{4}$  of a mile in length and  $\frac{1}{2}$  of a mile in width, and has a depth of about 21 feet at low water springs, which rise 6 feet.

The sum of \$3,000 was appropriated for expenditure in 1901-2, in the construction of a breakwater at Poirierville (Lower Descousse), but as the estimated cost of that work was found to be too large to entertain, it was decided to build a wharf at Descousse instead.

The amount voted for Poirierville in 1901-2 was revoted for expenditure during 1902-3, and on March 23, 1903, a contract was entered into for the construction of the said wharf, in the sum of \$4,388; but owing to the delay in the delivery of the creosoted timber piling, the work of construction had not been started at the close of the fiscal year.

The work under contract is a pile wharf, with creosoted timber bearing piles, beyond the line of the low water mark, extending out to 12 feet at low water, 307 feet in length and 22 feet wide, with an L on the western side of the outer end, 22 by 22 feet.

N.B.—The creosoted timber was delivered early in July, and the work of construction was commenced on July 27.

## DIGBY.

Digby, the shire town of the county of Digby, with a population of about 1,500, is beautifully situated on the south-western end of Annapolis basin. It is an important station on the Dominion Atlantic Railway, 67 miles north of Yarmouth, 150 miles from Halifax, 20 miles from Annapolis, and it is also a port of call for the daily steamer of the Dominion Atlantic Railway plying between Digby and St. John. The harbour is open at all seasons, and well protected from nearly all quarters; storms, however, from the north and north-east, drive a heavy sea against the pier, and if at such times there be much drift ice in the basin, the structure is likely to suffer damage.



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The first pier was built by the government of Nova Scotia some years before Confederation, and was nearly destroyed by the gales which swept the Bay of Fundy in 1866-7. In 1869 to aid in rebuilding the work, the sum of \$2,920.00 was granted by parliament and transferred to be expended by the provincial government. The pier, as then built, was of pile-bents 12 feet apart for 550 feet next a block of cribwork, 80 feet long and 45 feet wide, the southern half of which sloped so as to form an incline, rendered necessary by the great rise and fall of the tide (24 feet at springs). This incline was finished by a block 170 feet long by 22 feet wide, the northern half of this portion of the pier being all pile-bents, 8 feet apart. The outer end of the pier consisted of a block 56 feet long, 45 feet wide and about 40 feet high. The whole of the northern face was close-piled, the total length of the structure being 870 feet.

In 1872 the sum of \$1,650 was expended by the department in completing and repairing the pier. In 1874 a number of piles and braces were renewed, the outer block newly fendered, and new joists and planking laid for the total length. During the gale of February 22, 1879, a schooner loaded with produce for the West Indies parted a cable and was swept bodily through the pier, carrying away a length of 130 feet, which was rebuilt at a cost of \$2,367.73.

In 1881-2, the sum of \$888.57 was expended in renewing a few piles and other timbers that had been eaten away by the limnoria.

In December, 1885, the outer end of the pier was destroyed by a severe gale, and in 1885-6, the sum of \$1,945.62 was expended in repairs.

In 1886-7, a further sum of \$767.62 was spent on the same repairs.

In 1887-8, the sum of \$7,467.68 was expended on the construction of a block 40 by 40 feet on the site of the displaced outer block; of an inclined landing 26 feet wide and 80 feet long between the new outer block and the undestroyed inner portion of the pier, and the building of a roadway on pile and frame bents, connecting the whole work with the new outer block. In January, 1888, operations were begun towards building the pier to its original length, and the departmental report for the year 1888-9 shows an expenditure of \$4,498.14. The new work consisted of a block 45 feet by 45 feet to replace the former one. It is built of round timber with double sets of face-logs, and is fully ballasted; it is 45 feet high, and connected with the older portions of the work by a cribwork inclined landing, over the top of which a deck wharf is carried on heavy framed bents. The inclined landing and its superstructure is 25 feet wide. The in-shore or pile-work section was strengthened and repaired in places, and parts of the worn and decayed plank covering were renewed. In 1889-90 heavy piles were driven along both the northern and southern sides of the centre block, which was shifted and damaged by a storm in December, 1885, to prevent any further movement.

In 1890-1 and again in 1891-2, small expenditures were made on general repairs.

In 1890, a contract was entered into for the construction of a landing pier on a new site, viz., on the north side of the 'Racquet,' about a mile to the northward of the present pier and the town of Digby. For this purpose a quantity of timber and iron had been procured by the contractor. Owing, however, to numerous delays, and the death of the contractor, the intention of building this new pier was abandoned, and it was decided instead to repair and reconstruct the present pier, utilizing, as much as possible, the timber and iron belonging to the estate of the deceased contractor. The work of reconstruction was carried out by days' labour at a cost of \$15,248.15.

In April, 1894, a length of 330 feet of close-piling along the north side of the pier, together with the caps and walings for the same distance, and about ninety of the main outside bearing and fender piles, were destroyed by a violent gale. In order to save the balance of the structure from the scouring action of the under-tow, set up by the sheet piling, the rest of it was immediately cut out, and the sheet piling and other timber that had been knocked adrift was saved and piled up on the inner wharf. Subsequently in May and June, 1894, the sum of \$1,410.03 was expended in making good the damage done by the April storm. The sheet piling having proved a mistake, it was



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not replaced, but about ninety new, heavy piles were driven and thoroughly braced and bolted.

In 1895-6 the sum of \$4,341.99 was applied in filling with substantial, close-piled trestle work, a space or recess on the north side of the pier near its outer end, 210 feet long by an average width of 17 feet, and in raising from 2 to 3 feet and renewing the entire floor of the outer 225 feet in length.

In 1896-7 the sum of \$3,132.89 was applied to the reconstruction of the southern half of the shore end of the pier for a length of 450 feet, in substantial pile-work. The new work was covered with 6-inch plank, and securely capped, fendered and braced. In the year 1898-9 the sum of \$579.80 was expended in the renewal and repair of the outer south corner of the pier, which was damaged by being struck by the Dominion Atlantic steamship 'Prince Rupert' during a south-east blow in April, 1899. In addition to this, 40 feet in length of the inclined slope was replanked with 6-inch plank, and a couple of new fender piles were bolted into position.

In 1900-1, the sum of \$2,000 was expended in necessary renewals. The work done consists of the replanking of the wide part of the inclined slip 125 feet long by 25 feet wide, the narrow part 87 feet long by 17 feet wide, and a portion of the floor of the main wharf 18 by 22 feet, with 6-inch spruce deals.

In addition to this, an open shed, 100 feet long by 33 feet 6 inches wide, was erected on the outer end of the present shed and office, and over the inclined slip to protect freight when landed from steamers.

The importance of this pier may be judged by the fact that the collections for wharfage dues now amount to nearly \$3,000 per annum.

In 1901-2, the sum of \$3,300 was expended in repairs and improvements. The old freight shed was moved 100 feet up the pier and raised 4 feet in height. Adjoining it outwardly there was built a new shed 202 feet long, the upper 100 feet in length being built with the floor on a level with a boxcar, and the lower 102 feet built level with the floor of the pier. A portion of the pier floor was also renewed.

The arrangement is now most satisfactory and convenient for the handling of freight.

In 1902-3, the sum of \$3,697.77 was expended in rebuilding the lower 60 feet in length of the inclined slip. Owing to this portion of the work, which was of crib-work, being very much injured by the limnoria, the new portion was built of pile-work, the piles being driven through the ballast cribs. It was difficult and expensive work. In addition to this, a considerable portion of 6-inch plank on the shoreward end of the pier was renewed, and a number of the long hardwood fenders that had been broken by the daily steamer from St. John were renewed.

The total expenditure to June 30, 1903, is \$79,273.19, including a refund of \$11,623 to the provincial government in 1887-8, and not including an expenditure of \$4,192.02 in dredging.

Spring tides rise 24 feet; neaps about 20 feet.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.

## DRUM HEAD.

Drum Head, Guysboro county, is on the south or Atlantic coast of Nova Scotia, about 2 miles south-east of the entrance to Isaac's harbour. A shoal extending in a westerly direction from the 'Head' affords partial shelter to a small boat harbour.

A contract was entered into on November 13, 1902, for the construction of a breakwater to extend from Drum Head, in from 1½ to 2 feet at low water, to the shoal, for the sum of \$4,865.

The work under contract is of cribwork 350 feet in length and 16 feet in width on the top, fully ballasted, close fendered on the seaward side, and protected on the



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seaward side and at the outer end by a talus of stone sloping 3 to 1 from high water. Spring tides rise 5 feet.

At the close of the year ended June 30, 1903, 151 feet of cribwork was in place, of which the inner 80 feet was nearly up to required height, and the outer 71 feet to an average height of  $4\frac{1}{2}$  feet above low water.

The expenditure for the fiscal year was \$638.76.

#### EAGLE HEAD.

Eagle Head, Queen's county, is a fishing and farming settlement of about 200 people, situate on the eastern side of Eagle bay, on the Atlantic coast, about 6 miles north-east of Liverpool. About 20 years ago the provincial government built a stone breakwater here, 195 feet long, and from 20 to 25 feet wide on top. Between the years 1878 and 1882, the department extended the work a length of 125 feet, at a cost of \$2,000. It was then 320 feet long, from 20 to 27 feet wide on top, and 16 feet high at the outer end. The seaward and inner faces sloped  $1\frac{1}{2}$  to 1 and  $\frac{1}{2}$  to 1 respectively. The top of the work was 4 feet above high water ordinary spring tides. This breakwater is a great boon to the fishermen of this locality, affording protection to a fishing fleet, comprising about 30 small boats, flats and whalers. They take on an average about 40 quintals of fish annually.

In the year 1900-1, the sum of \$3,387.19 was expended in repairing and extending the breakwater. The work done in that year consisted in replacing the top 4 feet of the old work for its entire length and extending the new work a distance of 90 feet and riprapping the outside of the entire structure. The new work built was 90 feet in length, 32 feet in width on top, 56 feet at the bottom, and of an average height of 16 feet. The same style of work as that carried out in the old structure was adopted, with the exception that better materials were used and better workmanship secured. The top was most carefully laid, and the whole work may be classed as rough rubble masonry. In the year 1901-2, the sum of \$1,068.94 was expended in further extending this work; the extension built being 35 feet in length, 30 feet in width on top and 50 feet in width at the bottom, with a height of 17 feet at the outer end. In 1902-3 a sum of \$148.03 was applied in repairing the corner where the seaward face meets the outer end, and riprapping about 50 feet in length along the outer end of the breakwater with large stone, to prevent it from being damaged by heavy seas.

#### EAST BAY (NORTH SIDE.)

East Bay (north side), Cape Breton county, is on the north side of East bay, an arm of the Great Bras d'Or lake,  $5\frac{1}{2}$  miles from its head.

The wharf built at this place in 1889-90 extends 220 feet to 10 feet at low lake level, and consists of an approach of brush and stone 50 feet in length and 20 feet in width, four central blocks each 20 by 20 feet, and an outer block 20 feet, in line of work by 40 feet.

During the fiscal year 1902-3 the sum of \$600 was expended in repairing the approach and in renewing the floor-stringers, covering, guard-rails and fenders of the block and span work, and the face timbers and ties above high water in all the blocks except the outer end block.

The total expenditure to June 30, 1903, is \$2,949.87.

#### EAST BERLIN.

East Berlin, Queen's county, is a small fishing and farming settlement about 11 miles north-east of Liverpool, with a population of about 300.

In 1902-3 the sum of \$1,999.94 was laid out towards building a breakwater 330 feet long, 10 feet wide on top, and 9 feet high on an average, at a point near the centre



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of a shingle beach 700 feet long, protecting the harbour at East Berlin, which is bare at low water. The work performed consists of continuous, round-log, stone-filled crib-work, well fendered and ballasted and bolted. There is sufficient timber and iron on hand to complete the breakwater at a probable further expense of \$700.

## FINLAY POINT.

Finlay Point, Inverness county, is on the west coast of Cape Breton island, 3 miles north of the entrance to Mabou harbour.

Of the amount appropriated for expenditure in 1902-3 towards the construction of a wharf at this place, the sum of \$529.78 was expended in May and June, 1903, in procuring all the timbers, except stringers, cap-timbers and covering, and nearly all the iron required in the construction of the proposed wharf. The work proposed is to be of cribwork 15 feet in width, extending 148 feet from high water to 3 feet at low water, with an approach of brush and stone 150 feet in length.

Spring tides rise 4 feet.

## FORT LAWRENCE.

Fort Lawrence, Cumberland county, is a place on Cumberland Basin, at the head of the Bay of Fundy, near the mouth of La Planche river, 2 miles to the westward of the town of Amherst, and immediately west of the Chignecto Ship Railway Company's property.

On June 2, 1903, a contract (No. 4629) was let to Messrs. J. J. Lyons and J. White, of Ottawa, for the construction of a wharf at this place, for the sum of \$14,895.

The new wharf is to be built at a point on the north-east side of River La Planche, just within its mouth, on Cumberland Basin, and about 800 feet to the south-eastward of the basin excavated at the Bay of Fundy terminus of the Chignecto Ship Railway. The structure will consist of a section of pile trestle work 300 feet long, 50 feet wide and 43 feet high along the outer face, to be built parallel to the bank of the river, together with an approach, also of pilework, having an average length of 210 feet, a width of 36 feet, and an average height of 26 feet. Depth available along outer face of wharf proper, 37 feet at high water ordinary spring tides.

The main object of building this wharf is to afford convenient transportation facilities by water to the thriving town of Amherst. This town is built on the east side of the La Planche, 2 miles up from Cumberland Basin. Owing to the small volume of fresh water carried by this river and its very tortuous course, it affords no direct means of communication with the sea. The factories and industrial establishments in general are therefore compelled to have timber and other bulky raw materials brought by water to Sackville, N.B., to be sent thence to Amherst by rail, thus incurring heavy expenses for freight charges.

Spring tides rise here 45 feet, and neaps 33 feet. On June 30, 1903, no work had been done by the contractors, who were busy trying to procure the timber required.

## FRENCH RIVER.

French river, Victoria county, is on that part of the east or Atlantic coast of Cape Breton island known as the 'north shore,' about midway between the harbours of St. Ann's and South Ingonish.

An isolated breakwater, 50 feet in length, 27 feet wide, in from 6 to 7 feet at low water, was constructed during 1890-1-2. It was built of native squared timber, and close-fendered at the sides and outer end.

Shortly after its completion, the work was damaged and ballast went out of the face chambers, and the work began to settle. During 1892-3-4 the work was re-ballasted and a brush and stone bed was placed around it to prevent scour, but during



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1896 it was completely carried away by ice. During the last fiscal year the sum of \$391.82 was expended in constructing a work for the protection from the sea of the fish houses and the road in front of them, at the foot of the bank at the fishing station. The work is 140 feet in length, 8 feet wide on the top, 10 feet at the bottom, and of a uniform height of 5 feet. The inner face is plumb, the seaward face has a batter of 1 in 4, and the work is constructed with round timber cribwork on a brush bottom, with the seaward face close-sheathed.

Expenditure to date:

On isolated breakwater .. . . .	\$3,504 93
On protection work .. . . .	391 82
<hr/>	
Total expenditure .. . . .	\$3,896 75

FRIAR'S HEAD.

Friar's Head, Inverness county, is on the west coast of Cape Breton island, 6 miles to the northward of the entrance to Margaree harbour.

In 1900-01 the sum of \$494.50 was expended in procuring part of the materials required in the construction of a breakwater designed to close an opening in a ledge of rock lying parallel to the shore, at a fishing station near Friar's Head, and affording partial shelter to a small wharf and to the anchorage for boats. The work proposed included a concrete wall 90 feet in length, 4 feet in width on top, and 8 feet in height from 1 foot above low water, with a talus of large stone on the seaward side, sloping 2 to 1 from the top of the wall. In 1901-2 the sum of \$1,097.81 was expended in constructing about three-fifths of the concrete wall and one-half the talus, and in procuring part of the cement required to complete the work.

During the year 1902-3 the sum of \$629.96 was expended in completing the work proposed with the exception of 3 cubic yards of concrete in the west end of the wall and the talus. The stone obtainable for the talus was too light to withstand the sea. Those placed in 1901-2 were carried away.

The total expenditure to June 30, 1903, is \$2,222.27.

GRAND ETANG.

Grand Etang, Inverness county, is situated on the Gulf of St. Lawrence, about midway between the harbours of Margaree and Cheticamp.

The opening of a channel through a beach which separated the waters of the gulf from a large and deep fresh-water pond, and the construction of a channel protection work to make the pond available for use and shelter of fishing boats and small vessels, necessitated the diversion of the highway across the beach, and the construction in 1895-6 of a bridge across the pond, 500 feet above the former crossing.

The bridge is 563 feet in length, including the east and west approaches of brush and stone, with cribwork abutments, respectively 94 and 51 feet in length, and 438 feet of pile work. It is provided with a hand rail on each side, an opening for boats and a draw. The depth at extreme low water over the central 200 feet is about 6 feet, and to firm bottom, through water and soft mud or silt from 21 to 24 feet. The piles having been weakened by the ravages of the teredo, temporary repairs were made in 1898-9 and 1899-1900. In 1901-2 the sum of \$2,799.35 was expended in temporary repairs and in procuring all the creosoted piling and part of the native timber required for its reconstruction.

During the fiscal year 1902-3, the sum of \$1,020 was laid out in temporary repairs to the old bridge; in procuring the balance of the native timber required, and in constructing a new bridge parallel to and distant 9 feet from the south or inner side of the old bridge.



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The total expenditure in connection with works at Grand Etang to June 30, 1903, was :—

On channel and protection works. . . . .	\$23,870 64
On bridge construction 1895-6. . . . .	3,690 20
On repairs to bridge and on construction of new bridge. .	4,105 30
	<hr/>
	\$31,666 14

## GRAND NARROWS.

Grand Narrows, Cape Breton county, is on the south-eastern side of Barra Strait, which connects the Great with the Little Bras d'Or lake. It is an important station on the Intercolonial Railway, at the southern end of the railway bridge which spans the strait at this place; it is also a landing place for steamers, which call twice a day with mails and passengers for and from Baddeck, and make connection with the express trains going east and west.

The old wharf at this place was 287 feet in length, including 67 feet of cribwork filled with brush and stone and covered with gravel; 80 feet of pilework built in 1885-86 by the department over the remains of an old landing pier built by the provincial government; and an extension, 140 feet in length built by the department in 1883-84. The extension consisted of three blocks, each 20 by 20 feet, and an outer block or head, 20 feet in line of work and 60 feet in length, with openings between them of about 16 feet.

Repairs were made upon the structure from time to time, but it eventually fell into a dilapidated and dangerous condition, owing to natural decay and the ravages of the teredo, and it was decided to reconstruct it with creosoted timber piling.

During the year 1901-2, the sum of \$1,711.50 was expended in procuring the greatest portions of the materials required in the reconstruction of the wharf, including the creosoted piling.

During the last fiscal year the sum of \$1,300.66 was expended in constructing pilework extending 230 feet from the outer end of the 67 feet cribwork approach, or 10 feet beyond the outer end of the original outer block at its north side. The new work is 24 feet in width over 210 feet of its length, and 30 feet in width over the outer 20 feet.

The depth of water at the outer end of the wharf is 11 feet at low lake level and about 12 feet at high lake level.

The total expenditure on this work, up to June 30, 1903, including refund of \$1,289.70 paid to the provincial government, is \$8,698.36.

## GRAND RIVER.

Grand river, Richmond county, is a small tidal stream rising in Loch Lomond and emptying into the Atlantic ocean 6 miles to the eastward of the entrance to St. Peter's bay. The entrance is obstructed by a bar of sand, over which there is a depth of about 3 feet at extreme low water, and is rendered dangerous by several large rocks. Inside, the channel carries 6 feet at extreme low water to within half a mile of a bridge crossing the river 3 miles inland.

Instructions were issued to the resident engineer at Antigonish with regard to this place; that the sum of \$2,000 had been appropriated for expenditure during 1902-3 in opening a new channel, and that the survey was to be made and a report submitted.

A report was received under date January 31, 1903, on the opening of a new channel a quarter of a mile to the westward of the present entrance, in which the cost of the work proposed,—an 8 feet low water channel through the beach with a protection work on each side, and half a mile of inside dredging,—was estimated at \$80,000. Instead of opening a new channel, which on account of its cost and its



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doubtful utility and permanence could not be recommended, the improvement of the present channel by the removal of large rocks obstructing the entrance was suggested.

## GRANVILLE CENTRE.

Granville, Annapolis county, is a scattered settlement of some 300 people, situated on the right or north bank of the Annapolis river, 4 miles east of, or above, Granville ferry. Both banks of the Annapolis river, from the town of Annapolis to the head of navigation at Bridgetown, a distance of about 15 miles, are thickly settled by a thrifty, agricultural and fruit growing population.

In 1901-2, the sum of \$851.02 was expended in constructing a pile wharf, 90 feet long, 25 feet wide, with an L 25 feet long, giving a face length of 50 feet along the face of the wharf. The wharf is 18 feet high, carrying at high water a depth of 16 feet.

In 1902-3, the sum of \$857 was expended in completing the wharf, in constructing a road approach 900 feet long, and in building a freight shed 26 x 14 feet on the outer end of the wharf.

Spring tides rise about 27 feet.

## GREEN COVE.

Green Cove, Victoria county, is a small fishing station on the eastern or Atlantic coast of Cape Breton island, nearly midway between North bay, Ingonish, and Neil's harbour, being about 5 miles north from the former, and 4 miles south from the latter.

The cove is a small indentation in the general coast line, about 400 feet in depth and 900 feet in width, and is protected on the southern end by a reef and from the eastward by outlying ledges.

In 1889-90, the sum of \$200 was expended by the department in improving the landing place for boats at the northern end of the cove, by the removal of bedded rock and boulders.

At its session of 1902 parliament appropriated the sum of \$500 for expenditure during the fiscal year 1902-03 in the construction of a breakwater, but as it was found that the amount was too small for the work required, plans and specifications were prepared for a breakwater extending from the shore to the innermost of the outlying ledges, and a contract was entered into on February 4, 1903, for its construction, for the sum of \$6,475, but up to the end of the fiscal year the work had not been started.

The work under contract is 450 feet in length, and 16 feet wide at a height of 2 feet above high water, with top rounded off and sides sloping 2 to 1, the inner 180 feet consisting of a stone embankment, and the outer 270 feet of a stone embankment with cribwork core.

The amount expended in calling for tenders, &c., was \$91.18.

## GROS NEZ.

Gros Nez, Richmond county, is a small fishing station at the eastern extremity of Petit de Grat island.

A breakwater, undertaken in 1885-6, with the object of restoring a beach forming a natural landing place to its original condition, and protecting the anchorage for boats, was completed the following year. It is 150 feet in length, including 124½ feet of cribwork 14 feet in width on top and 8 feet in average height, and a stone embankment at each end.

During the fiscal year 1902-3, the sum of \$384.51 was expended in renewing the floor stringers, covering and cap timbers of the breakwater, and in placing 15 new fenders on its seaward side and 1 on its inner side.



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The total expenditure to June 30, 1903, including a refund of \$106.95 expended by the provincial government, is \$2,241.46.

## HAMPTON.

Hampton, Annapolis county, formerly Chute's Cove, is situated on the south-east side of the Bay of Fundy, 27 miles north-east of Digby Gut and 6 miles north-west of Bridgetown, an important station on the Dominion Atlantic Railway. It has a population of about 200 people, engaged in fishing, farming, and the export of cord-wood and timber.

In 1855 and 1856, a small pier 165 feet long was built near the western side of the cove, the provincial government contributing \$600 to its cost. The site was chosen by commissioners, apparently without professional advice, and was objectionable on many accounts. In 1879, at a cost of \$3,000, an addition of 121 feet was made by the department, and the older portion of the work strengthened with the hope of remedying some of the defects of location.

In 1881, on further examination, it was found that the original work had been badly undermined by the sea, and that owing to the direction of the pier the shingle was fast shoaling the water on the inside. It was therefore decided to rebuild the structure on another site about half a mile to the eastward, which was carried out at a cost of \$2,300. The new pier, as then completed, was 246 feet long, more substantially built, and much better located than the old one, it being situated immediately to the westward of a small brook which serves to keep the schooner berth alongside free from sand. In 1888-9, it having been found that the stream had worked under the foundation, endangering the whole structure, the department expended the sum of \$750 in close-piling the inner face, levelling up the top of the work, which had settled in places, putting in some additional ballast, and effecting general repairs to the covering and break.

In February, 1889, during a heavy freshet, the brook again gave some trouble, tearing away its banks and the gravel beach, and threatening to undermine the breakwater. In 1890-91, the department spent \$21 in repairing the damage and in turning the brook into its original channel. In 1892-3, the breakwater being found not quite long enough to afford convenient berth for schooners, the department applied the sum of \$1,500 in constructing a block 40 feet long, 27 feet wide on top and 27 feet high on the outer end, and in repairing about 100 feet of the inner end of the old work by raising the inner face, putting in new floor stringers and covering them with new planking, thus putting the work in a thorough state of repair.

In the year 1898-99 the sum of \$1,999.79 was expended in thorough repair of the breakwater. The whole top of the work for the outer 185 feet in length, 20 to 26 feet in width, was raised with new work for a height of from 2 to 4 feet, rendered necessary by the great and unequal settlement of the work caused by the scouring action of the little stream that discharges alongside and had made its way beneath it. To prevent a repetition of this action, the inside face of the breakwater was protected for a length of 80 feet with a puddle wall faced on the outer side with 3-inch plank. The breakwater has a total length of 270 feet, a width of from 20 to 26 feet, and a height, at the outer end, of 24 feet, where at H. W. O. S. T. there is a depth of 21 feet of water.

In 1902-3, the sum of \$207.63 was expended in sheathing with close piling about 53 feet on the shore end of the east side of the breakwater, to prevent the little stream that issues to the east of the breakwater from undermining the work.

The total expenditure to June 30, 1903, including a refund to the provincial government of \$1,538.10, is \$11,316.52.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.

Spring tides rise 32 feet; neaps, 18 feet.



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## HAWK INLET.

Hawk Inlet, Shelburne county, is an inlet on the extreme southern end of Cape Sable Island, about 2 miles south-east of Clarke's harbour, and is the centre of a very important fishing station on that island. It has never been navigable for even small boats at all stages of the tide, so that when it was storm, fishermen had to either refrain from going out, or else being out were unable to get home till after the tide had risen sufficiently to allow them to float their boats across a series of sand flats about 1,000 feet long, which intervened between their exposed boat anchorage outside and a safe harbour in the inlet. With a sum of \$484.29 expended in 1901-2 and the further expenditure of \$215.71 incurred in 1902-3, forming a total outlay of \$700, a boat channel about 240 yards long and 20 feet wide was opened, leading to the safe harbour in the inlet. The work through sandy shoals was carried on, as a rule, with plough and harrow, and, when possible, with shovels. About 55 tons of rocks were also removed, some of which had to be blasted. Where first dug, the channel has washed out to a depth of 3 feet at low water; in other places the depth secured is not great, but there is sufficient water everywhere to allow small boats to float at the lowest tides. There are still some rocks that should be removed to make the work undertaken complete, viz., so as to permit of the passage of the larger class of boats at all times.

## HERRING COVE.

Herring Cove, Halifax county, is a small land-locked basin or inlet, situated on the west side of the mouth of Halifax harbour,  $5\frac{1}{2}$  miles in a direct line nearly south from the city. On both sides of the cove is a fishing village of about 450 persons, wholly dependent upon fishing. The annual value of the catch is \$100,000. In 1874 the department spent the sum of \$2,400 in dredging a bar of sand and silt that had formed at the entrance to the cove, a little over 12,000 cubic yards of material being removed. In 1894-5, the bar having re-formed, the department dredge 'George McKenzie' dredged 12,915 cubic yards, besides numerous large boulders. On February 16, 1903, a contract (No. 4559) was entered into with Messrs. Reid & Archibald, of Halifax, for the construction of a breakwater on the east side of the mouth of the cove. The work, when completed, will be 150 feet long, 35 feet wide on top, and 20 feet high at the outer end, where, at high water ordinary spring tides, there will be about 16 feet of water. Spring tides rise 6 feet, neaps 5 feet.

The breakwater will be substantially built of round-log cribwork, the lower portion, up to half-tide, being of creosoted timber, to resist the ravages of the limnoria. Up to June 30, 1903, creosoted and other timber had been delivered on the site of the work and the expenditure was \$3,855.05.

## HUNT'S POINT.

Hunt's Point, Queen's county, is a small fishing settlement, 2 miles north-west of White Point, and 7 miles from Liverpool town, with a population of about 200. The only harbour at this place is a small cove, primarily protected by a beach, which in turn was protected by a block of cribwork about 35 feet long by 30 feet wide, built by the provincial government before Confederation. This block being found inadequate for protection purposes, the department, in the fiscal year 1899-1900, constructed a small breakwater supplemented by beach protection work. The breakwater is 120 feet long, 12 feet wide on top and 12 feet high at the outer end. The beach protection is 130 feet long, from 4 to 5 feet high and 6 feet wide on top. The breakwater is constructed of round-log, stone-filled cribwork, the outside being sheathed with timber spars, hewn to a thickness of  $5\frac{1}{2}$  inches. The beach protection consists of open-face, stone-filled cribwork. In 1902-3, a sum of \$449.41 has been applied in replacing the



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old decayed block by a new cribwork 35 feet long, 20 feet wide, and of an average height of 10 feet, and building a break  $2\frac{1}{2}$  feet high the entire length of the breakwater. A further sum of \$105.43 was expended in making repairs to another block of cribwork.

## INDIAN BROOK FLATS.

Indian Brook Flats, Shelburne county, consists of a line of flats running off-shore into Barrington Passage, which are distant from the village of that name  $\frac{1}{2}$  mile to the south-west, the settlement in their immediate vicinity is called North-east Point. The government wharf in course of construction here will not only accommodate this settlement, but about 300 or 400 people living from 1 to  $2\frac{1}{2}$  miles therefrom. The occupation of all these people is fishing, and they have hitherto had no facilities whatever for carrying on their vocation. In order to afford these people increased facilities for such purpose, parliament at its session of 1902, made an appropriation of \$2,700 for this wharf. The only site found suitable for the construction of the proposed public wharf was that already occupied by a small wharf belonging to a resident of that neighbourhood. This site, together with the right of way to the public road, was purchased by the department for the sum of \$150. When completed this wharf will consist of four distinct sections, a rock bank approach 41 feet long; a piece of block and span work 56 feet long; a pile trestle-bent stem 374 feet long and a pile trestle-bent head 40 feet in length, making a total length of 511 feet which carries the wharf from the shore line to the channel bordering the outside edge of the flats. The approach is of the usual rock-bank style, 27 feet wide on top and has a height at the outer end of about 9 feet. The block and span work consists of 2 blocks of round-log stone filled cribwork, each 20 feet long and separated by a clear span of 16 feet in length; it has a width on top of 18 feet and a height at the outer end of about 10 feet. The stem consists of 34 pile-trestle bents placed 11 feet centre to centre of piles, all of 16 feet in width, and having a height of 11 feet at the outer end. The head of this wharf is 40 feet long and 50 feet wide on top, built of 5 pile trestle-bents, well fendered and braced; it has a height of about 23 feet at the outer end standing on the extreme edge of the channel. In 1902-3 the piles were all driven, the approach and cribwork all completed and the caps and about one-half the stringers and the trestle-bents put in place and fastened; the total expenditure incurred for these works being \$2,648.81. It is estimated that the wharf can be completed in 1903-4 with a further outlay of \$500. The site of this work is in a protected place, where but little ice or tide is likely to injure it; hence it was built of a lighter type than other works of a similar nature.

## INGONISH (NORTH).

Ingonish (north), Victoria county, is on the eastern coast of the northern part of Cape Breton Island, about midway between Sidney Harbour and Cape North. It is separated from the south bay of Ingonish by a narrow, rocky and precipitous peninsula, over two miles in length.

On December 6, 1899, a contract was entered into for the construction of a breakwater at Archibald's Point on the north side of the bay, for the purpose of forming a harbour of refuge for fishing boats, and the work was completed on December 20, 1900.

The breakwater is 484 feet long, with an L  $77\frac{1}{2}$  feet long, and from 18 feet at the inner to 24 feet wide at the outer end, and is constructed of squared timber, laid closeface, with creosote timber substructure, fully ballasted and fendered, sheathed on the seaward face and end, and protected on the seaward side by a stone talus.

During 1901-2, the sum of \$951.36 was expended in raising the stone talus for a distance of 220 feet from the inner end, up to the top of the work.

During the last fiscal year, the raising of the stone talus commenced in the previous year, was completed, at a cost of \$1,515.52.



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The depth of water along the face of the L at lower water springs, is 11 feet. Spring tides rise 4 feet.

The work has proved of great benefit to the fishermen of that district.

The total expenditure to date is \$30,279.51.

#### INGONISH (SOUTH).

Ingonish bay, Victoria county, is situated on the eastern coast of Cape Breton island, about midway between Sydney harbour and Cape North. It is divided into north and south bays by Middle Head, a narrow, rocky neck of land over 2 miles in length.

At the head of South bay there is an extensive lake, separated from the sea by a beach, through which there formerly existed but a shallow channel.

In 1873, works were undertaken by the department for the improvement of the channel. On their completion in 1876 there was a channel 200 feet in width, with a depth of nowhere less than 14 feet at low water, and with its northern sides protected by a pier 500 feet in length, thus giving access for vessels to the lake, which has an area of about 400 acres and great depth, and affords a safe and commodious harbour.

The pier, on which small sums were expended every year from 1876 to 1880, and large amounts in 1881 and 1882, sustained serious damage during heavy easterly gales in 1882, and was subsequently carried away down to below low water level.

In 1886-87, an anchor and a mooring buoy were placed in the harbour near the entrance, and a beach protection work, 58 feet in length and 20 feet in width, was constructed on the northern side of the entrance, to prevent the sea from cutting away the end of the beach, and opening up a channel between it and the remains of the old breakwater; and during 1894-5 a breach at the back of the protection work was closed with a cribwork block, 45 feet in length and 15 feet in width, and brush and stone placed at its sides.

In 1893-94, a public wharf was constructed on the northern side of and near the entrance to the harbour, consisting of a block of cribwork 31½ feet wide on top and 30½ feet in length, with an approach of brush and stone, 45 feet in length and 20 feet wide. The depth of water at the outer end, at extreme low water, is 8½ feet.

During a severe easterly gale, accompanied by an extraordinary high tide, on February 4, 1895, the beach separating the harbour from the bay was swept from end to end. Nearly all the buildings and private wharfs were destroyed and carried away, but the public works were not disturbed, with the exception of some settlement in the slope on the seaward side of the beach protection work.

Since the destruction of the breakwater in 1882, the channel has been gradually contracting and getting shoaler, but it is still some 70 feet in width, and has a depth of 12 feet at low water. Spring tides rise 4 feet.

On February 28, 1903, a contract was entered into for the construction of a wharf on the southern side of the harbour and near the entrance, in the sum of \$2,485, but work of construction was not commenced up to the end of the fiscal year.

The work under contract is 160 feet in length, extending to 16 feet depth at low water, and consists of a shore abutment and 4 cribwork blocks, with intervening spans. The abutment and the 3 inner blocks are to be 16 feet wide, and the outer block which forms the head 30 by 30 feet, constructed of round timber, with creosoted timber substructure, and close sheathed around the end faces.

The total expenditure to date for works at this place, not including expenses incurred in connection with the work under contract, is \$93,693.31.

#### IRISH COVE.

Irish Cove, Cape Breton county, is on the south-east shore of the Great Bras d'Or lake, near the entrance to East bay. The distance to the head of East bay is



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20 miles, to St. Peter's canal about 22 miles, and, across the lake, to Grand Narrows, 10 miles.

The wharf at this place, completed in 1892-3, is 160 feet 8 inches in length and 20 feet in width, including a shore block 47 feet in length, a central block 20 feet 4 inches in length, and an outer block 57 feet in length with an L 20 by 20 feet. It was strongly constructed, fully ballasted, and had the exposed face of the outer block protected by close-piling. In 1898-99 and 1900-01 part of the close-piling of the outer block (the whole of which had been either damaged or destroyed by the teredo) was renewed.

During the fiscal year 1902-3 the sum of \$499.96 was expended in renewing 165 pieces of close-piling and 60 lineal feet of guard rail, in replacing about 20 tons of ballast, and in repairing the covering.

The total expenditure to June 30, 1903, is \$4,058.52.

## ISAAC'S HARBOUR.

Isaac's Harbour, Guysboro' county, is a small but safe harbour on the southern or Atlantic coast of Nova Scotia, 36 miles to the westward of Cape Canso, and 16 miles to the eastward of the entrance to St. Mary's river.

The public wharf on the west side of the harbour, completed in August, 1901, extends 295 feet to 12 feet depth at low water. It consists of a stone abutment 135 feet in length, and a block and span extension 160 feet in length, including 3 blocks each, 22 by 22 feet, and an outer block 22 feet in line of work by 48 feet.

During the fiscal year 1902-3 the sum of \$723.19 was expended in constructing a small warehouse 37 by 17 feet on the south side of and at the inner end of the wharf.

The total expenditure to June 30, 1903, is \$4,809.11.

## ISLAND POINT.

Island Point, Victoria county, is on the south side of Boularderie island, 18 miles west from the bridge crossing the little Bras d'Or at the head of St. Andrew's channel an arm of the Bras d'Or lake.

A wharf 120 feet in length and 20 feet in width, with an L at the outer end, 20 by 21 feet, extending to 11 feet at ordinary lake level, and consisting of blocks and spans, was constructed by the department during 1886-7.

During 1892-3, the sum of \$499.48 was expended on repairs to the wharf, which had been damaged by ice.

The ravages of the toredo below and the natural decay of the wood above the water level caused the work to settle and become dangerous, and the sum of \$550 was appropriated for expenditure in repairs during 1902-3.

When the work was visited to start the repairs, it was found that the inner blocks required to be reconstructed, and that the top of the outer block had been carried away down to 3 feet below low water, and as the amount voted was entirely too small to reconstruct the whole work, out of the appropriation the sum of \$513.37 was expended in reconstructing the inner end, and in procuring a portion of the native timber required to reconstruct the outer block.

The total expenditure on this work up to June 30, 1903, is \$2,973.54.

## JANVRIN'S ISLAND.

Janvrin's island, Richmond county, is a large island to the westward of Madame island, and is separated from it by Mousselier's passage. It is about 5 miles in length and 3 miles in width, and is surrounded on the southern and western sides by shoals which extend in some cases half a mile from the shore. It has but one little harbour.



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called Janvrin's harbour, on the southern side, with about 9 feet at low water, but the entrance thereto is so long and intricate that it is not of much benefit.

The sum of \$2,000 was voted for expenditure during 1902-3 on the wharf on Janvrin's island without any previous examination. The island was visited twice for the purpose of locating the site and to obtain necessary information, but as the residents have not as yet decided on what part of the island they desire to have the wharf located the survey has not as yet been made, and no expenditure was incurred.

#### JUDIQUE.

Judique, Inverness county, is on the east side of St. George's bay, 10 miles south of Port Hood, and 16 miles north from the entrance to the Strait of Canso.

During 1898-99, 1900 a breakwater 725 feet in length and 20 feet in width, with an L 20 by 20 feet, at the outer end, and extending into 6 feet at low water, was built by the department at McKay's Point, for the protection of fishing boats.

The work is constructed of round timber, laid open-faced with creosoted timber substructure, is fully ballasted, close sheathed around the outer end and the L, and protected on the seaward side by a talus of stone.

During the severe north-westerly gale on September 12, 1900, which caused so much damage along the coast of the Gulf of St. Lawrence, this work was fully exposed to its fury, and was slightly damaged.

During the last year the sum of \$898.77 was expended on repairs and improvements, as follows : the floor stringers and the covering, for a distance of 137 feet, where they had been disturbed, were replaced; the face chambers, for a distance of 550 feet were re-ballasted, where ballast had been washed out, this portion of the work was close-fendered, and some 407 lineal feet of the cap timber along the seaward face was renewed.

The expenditure on this work up to June 30, 1903, is \$20,805.88.

#### KEMPT HEAD.

Kempton Head, Victoria county, is on the northern side of Boularderie Island, on the Great Bras d'Or Channel, and about one mile from Boularderie Head, the south-western end of the island.

During 1901-2, a wharf 185 feet in length and 20 feet wide, with an L on the outer end, 20 by 20 feet, extending out into 12 feet at low lake level, was constructed by the department.

It is a block and span structure, and consists of an approach of stone, clay and gravel, 10 feet long; of a cribwork abutment, 55 feet in length; of two cribwork blocks, each 20 by 20 feet, and of an outer block 20 by 40 feet, with 20 feet openings between the blocks, spanned and covered over. The abutment and the blocks are constructed of round timber, laid open-face, creosoted up to high water, well protected with fenders, and the outer faces of the two outer blocks, with close-sheathing.

During the last fiscal year the sum of \$719.56 was expended in the construction and fencing of a road, 900 feet in length and 20 feet wide, to connect the wharf with the public road.

The total expenditure to June 30, 1903, is \$5,242.56.

#### KINGSPORT.

Kingsport, King's county, formerly known as Oak Point, is a village of some 500 people, on the south-west side of the basin of Minas, between the mouth of the Cornwallis river and Cape Blomidon. It is the terminus of the Cornwallis Valley Railway (opened December, 1890, and now a branch of the Dominion Atlantic Railway), running to Kentville, the county town, 14 miles to the south. A pier, 445 feet in length,



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built of piles, already stood here when the harbour was taken in charge by the Department of Public Works. In 1873-4 the department built cribwork 12 feet wide on the eastern or exposed side of the wharf for the purpose of breaking the force of the sea. In 1875 the work was extended a length of 240 feet, by a width of 30 feet in order to increase the sheltered area and afford earlier access to the roadstead in lee of the pier, which, owing to the great range of tide, was dry between half ebb and half flood. In subsequent years repairs were several times made. In December, 1890, the Cornwallis Railway was opened for public traffic and about the same time the wharf, which forms the terminus of the railway, and on which is a track, passed by agreement with the department, under the control and ownership of the railway company.

During the fiscal year 1901-02, the sum of \$9,276.72 was expended in rebuilding the upper half of the outer block of solid cribwork, 270 feet long, which was built in 1875. A widening or re-enforcing block 10 feet wide was also built on the north side for the whole length of this outer portion.

In 1902-3 the sum of \$4,934.60 was expended in continuing the repairs and renewals to the work begun last year. The outer 130 feet in length of the pier was taken down to a height of 15 feet and rebuilt in substantial cribwork. On the north side of the pier for its whole length of 700 feet a re-enforcing block, 10 feet wide was built. This latter is not yet up to finished height, still lacking from 3 to 6 feet.

Spring tides rise 48 feet, neaps 40 feet.

Total expenditure by the department up to June 30, 1903, including a refund to the provincial government of \$1,738.14 in 1887-8, is \$41,779.29.

## L'ARDOISE.

L'Ardoise, Richmond county, is situated on the eastern side of St. Peter's bay, near its entrance from the Atlantic ocean, and about 9 miles east from the southern entrance to St. Peter's canal.

An isolated breakwater built off Martin's Point, in from 5 to 10 feet at low water, in 1876-77, and almost destroyed in 1883, was reconstructed during 1891-2-3.

The work consists of a timber core, 400 feet long and 20 feet wide, placed over the remains of the original structure, in from 1 to  $4\frac{1}{2}$  feet at low water, its top standing 1 foot above high water, the whole being covered with stone, sloping 3 to 1 on the seaward side and outer end, and 2 to 1 on the inner side and inner end. The whole surface of the work, above low water mark, was covered with stone of not less than 15 cubic feet each, and the spaces between the stones above the line of high water were filled in with concrete.

Since the completion of the work the covering stones on the seaward and outer end slopes, which had been disturbed by the sea, have been replaced, and a concrete wall, 3 feet wide on top and  $4\frac{1}{2}$  feet in height, with top flush with the surface of the covering, has been constructed over the outer face and the ends of the cribwork core.

The breakwater averages  $17\frac{1}{2}$  feet in height, from the original bottom up to the top of the stone covering, which is 5 feet above high water, and 10 feet above low water springs.

In order to stop the undertow from sweeping into the harbour through the gap, between the inner end of the breakwater and the shore to the eastward of it, a distance of about 1,200 feet, the sum of \$3,000 was voted for expenditure during 1901-2, and the sum of \$7,500 for expenditure in 1902-03 towards the construction of works to effect the same.

A plan and specification for the proposed work were submitted in January, 1902, but up to the end of June 30, 1903, the proposed work had not been let.

The sum of \$25.27 is charged to this work on account of printing.



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## LARRY'S RIVER.

Larry's River, Guysboro county, is at the western extremity of Tor bay, on the southern or Atlantic coast of Nova Scotia, 24 miles to the westward of Canso harbour.

The harbour, a channel through mud flats improved by dredging, was formerly protected from the eastward by a beach and bar of shingle. Since 1896 the point of the beach at the northern extremity of the bar and the bar itself have been lowered and carried inward toward the channel.

In order to restore the shelter formerly afforded by the beach and bar, a contract was entered into on September 22, 1902, for the construction of a breakwater, for the sum of \$15,840.

The work under contract consisted of two sections of stone embankment, respectively 125 and 379 feet in length, each 14 feet in width at the level of 2 feet above high water and 6 feet in average height, and a central section of cribwork 500 feet in length, 14 feet in width on top and  $11\frac{1}{2}$  feet in average height, protected on the seaward side by close fendering and by a talus of stone sloping 2 to 1 from high water. The embankment and cribwork are to be finished at a height of 4 feet above extreme high water. Spring tides rise 6 feet 6 inches.

During the fiscal year 1902-3 very little work was performed, operations not having been commenced till June 22. The amount expended on the work performed up to June 30, 1903, was \$749.81.

## LINGAN.

Lingan, or Bridgeport harbour, Cape Breton county, is at the head of Indian bay on the north-east coast of Cape Breton island, about 5 miles to the eastward of the entrance to Sydney harbour. A large pond or basin, having a depth of 8 feet at low or 12 feet at high water, is separated from Indian bay by a beach of sand. The entrance, which forms the harbour, was deepened and straightened by dredging in 1878-80 to improve the facilities for shipping coal from the Lingan mines, since abandoned. It is now crossed by a bridge built by the provincial government for the accommodation of traffic over the beach between Lingan and Bridgeport.

A work of brush and stone 1,900 feet in length, constructed in 1876-8, afforded an efficient protection to the beach up to 1893, but has since been carried away in places over distances aggregating 1,400 feet.

In 1901-2 the sum of \$1,999.60 was expended in constructing 1,000 feet of brush and stone work, 14 feet in width and  $4\frac{3}{4}$  feet in average height, leaving 1,370 feet, 13 feet in width and 3 feet in average height, to be constructed to complete the work undertaken.

During the fiscal year 1902-3 the sum of \$599.89 was expended in constructing 500 feet of brush and stone work.

## LIVINGSTONE'S COVE.

Livingstone's Cove, Antigonish county, is on the south-eastern shore of Northumberland strait, about 2 miles south-west from Cape George.

For the purpose of affording shelter to the fishing boats of the district, and a landing place for steamers and small vessels, a breakwater was commenced by the department in 1899, and completed in September, 1902.

During the last fiscal year the sum of \$1,519.51 was expended in completing the head block, or outer end, of the breakwater, the materials for which were procured during the previous year. The head block is 48 feet long, 24 feet wide on top, and of an average height of 18 feet, and is constructed with native squared timber, laid with 7-inch openings, fully ballasted and close-sheathed on all outer faces, with hardwood sheathing.



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The complete work extends out into 9 feet at low water springs, is 312 feet in length, and is approached by a road cut through the clay bank 105 feet in length. The breakwater is a continuous structure, and consists of a shore abutment with stone retaining walls, 30 feet long and 18 feet wide, on top; of a cribwork block 80 feet long and 19 feet wide, and of a cribwork extension 202 feet in length and 24 feet wide, with an L on the southern side of the outer end 24 by 24 feet. The crib-work is constructed with native squared timber, laid with 7-inch openings, fully ballasted and fendered, and sheathed with hardwood on the northern or seaward face, the outer end and the southern face of the L.

Spring tides rise  $4\frac{1}{2}$  feet.

The total expenditure on this work up to June 30, 1903, is \$14,062.22.

## LITTLE HARBOUR.

Little Harbour (Arnold's Point), Shelburne county, is situated on the south-east-erly extremity of Black Point, about 5 miles east of Lockeport. It has a population of about 250 people, who are chiefly engaged in fishing operations for a livelihood. The fishermen have no protection for their boats, and lose many valuable craft for want of shelter.

At its session of 1902, parliament made an appropriation of \$1,700 for the construction of a breakwater-wharf, 280 feet long, for the protection of this harbour; but, owing to the destruction of the lumber mills of the place by fire, the work could not be carried on in 1902-3, as was intended. Expenditure up to June 30, 1903, \$138.68. The breakwater is to be completed in 1903-4, at a probable total cost of \$2,500.

## LITTLE NARROWS.

Little Narrows, Victoria county, is a settlement on the south side of the Little Narrows, a contraction of the St. Patrick's channel, an arm of the Bras d'Or lake, at a point 7 miles to the eastward of the village of Whycocomagh, at the head of the channel.

The wharf constructed at Little Narrows in 1887-8 consisted of a shore block  $47\frac{1}{2}$  feet in length, and 20 feet in width, and a pile extension 72 feet in length, with an L 40 feet in length on the west side. After its completion, a warehouse was built on the western side of the shore block.

In 1897-98 the sum of \$499.65 was expended in reconstructing the outer end, a T head 60 feet in length having been substituted for the outer 20 feet and L, in renewing the piles in three out of the five bents in the extension, and in repairing the covering.

During 1901-2, the sum of \$1,494.80 was expended in effecting the following repairs and improvements, and in reconstructing a small ferry slip :—

The outer end, or 'head,' was repaired and strengthened by placing 35 fender piles and 4 new bearing piles under each bent, and the warehouse was thoroughly repaired including the renewal of the flooring and roof covering and the painting of the exterior.

During the last fiscal year the sum of \$499.04 was expended in extending the head of the wharf, with pilework, a distance of 12 feet outwards, in order to enable steamers to back out away from the wharf, when vessels are lying at the private wharf alongside without going aground in shoal water.

The total expenditure to date is \$3,993.49.

## LOWER COVE.

Lower Cove, Cumberland county, is a small and scattering settlement of about 350 or 400 population, situated on the shores of Cumberland basin, about  $2\frac{1}{2}$  miles north of Joggins Mines. The chief industry of this place is the manufacture and



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exportation of grindstones, which business is conducted by a company known as the Atlantic Grindstone Company, Limited. The number of employees of the company differs with the seasons, but it never is less than 60 and often about 120. Under a new management this company was desirous of extending their business, and at a proportionate larger expense they enlarged their plant to nearly double its former capacity. They, besides improving their machinery, had expended a large sum in constructing a wharf. This wharf is situate on the shores of a small cove, from which this place takes its name, but even then it was exposed to heavy seas, so that it was difficult to procure vessels to load at the pier.

In order to protect this wharf the department, during the fiscal year 1901-02, began the construction of a breakwater on the other side of the cove, and a further grant was made by parliament at the session of 1902 to complete this work. This breakwater has been completed in 1902-03, the expenditure amounting to \$1,301.86. Total cost of work, \$3,731.66. There was an old work on the site of present work built by the provincial government, which had been partially destroyed; this work proved to be of less use than was calculated on. The breakwater as now completed is 202 feet in length, has a width, on top, of 20 feet, and a height at the outer end of 29 feet. It is constructed of continuous round log, stone filled cribwork, well fendered and sheathed on the outside face and end with 4½-inch hewn sheathing. The ballast used is of exceptional quality, and well packed by hand. In the fall of 1902, when the work was but partially finished, vessels had no difficulty in lying at their moorings at the pier on the other side of the cove, and the parties interested appear to be well satisfied with the results secured.

#### LOWER WEST PUBNICO.

Lower West Pubnico, Yarmouth county, is a thrifty and thickly populated district, situated on the west side of Pubnico harbour, from 30 to 35 miles south-east from Yarmouth. The people are engaged in fishing and farming.

In 1902-3 the sum of \$1,000 was expended in rebuilding and converting into a public wharf an ancient cribwork wharf, situated at the lower or southern end of the district. The outer 120 feet in length of the old work was substantially rebuilt in pile-work; it is 25 feet wide and from 8 to 14 feet high. At the outer end there is about 11 feet of water at H. W. O. S. T.

Spring tides rise about 12 feet.

#### MABOU.

Mabou harbour, Inverness county, is on the west coast of Cape Breton island, 6 miles north-east from Port Hood.

The entrance was formerly at the southern extremity of a range of sand hills and by an intricate channel obstructed by a bar, over which there was a depth of only 4 feet at extreme low water.

The opening of a new channel through the sand hills at the northern extremity was undertaken in 1872. A pier 835 feet in length, on the southern side of the new channel, was completed in 1876, and the same year the old channel was closed. Expenditures were made nearly every year from 1876 to 1902 in repairs to the pier, the construction of brush and stone work on the southern side and of protection works on the north side of the channel, and in dredging.

On the completion of repairs undertaken in 1901-2, the work included:—

On the south side (a) the remains of a pier 835 feet in length and 20 feet in width, founded in about 12 feet at extreme low water, and sloping from about 10 feet below extreme low water at the face to 2 feet above extreme low water at the back.



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(b) A work of brush and stone of various widths extending outward from the outer end of the pier about 1,600 feet, the inner end of which is 8 feet above and the outer end 5 feet below extreme low water.

(c) Brush and stone work at the back of the pier 800 feet in length, 10 to 12 feet in width, on top, and 7 feet in average height.

(d) On the north side, 5 pile and brush groins, 4 of which are from 75 to 85 feet in length, and one 45 feet in length.

The minimum width of the channel opposite the pier is about 130 feet. The depth at extreme low water, in the channel opposite the pier, varies from 12 to 15 feet. Over the bar, about 600 feet out from the head of the pier, the minimum depth, at extreme low water, is 8 feet 3 inches. Spring tides rise 4 feet.

During the fiscal year 1902-3, the sum of \$1,198.71 was expended in raising and repairing the brush and stone work at the back of the pier; in constructing a cross wall of brush and stone 159 feet in length, 12 feet in width and 5 feet in average height between the inner end of the brush and stonework and the shore; and in repairs to the groynes on the north side of the channel.

The total expenditure to June 30, 1903, is \$134,750.07, and \$22,535.23 for dredging

## MAIN-À-DIEU.

Main-à-Dieu, Cape Breton county, is a small harbour on the eastern coast of Cape Breton island, 10 miles north from Louisbourg.

A breakwater 230 feet in length was built on the east side of the harbour in 1881-2. It consists of a cribwork core fully ballasted and covered with stone, sloping on the seaward side at the outer end 3 to 1, and on the inner side 2 to 1.

During the fiscal year 1902-3, a plan and specification were submitted and tenders were invited for the construction of a breakwater on the west side of the harbour designed to stop the undertow and thus make the anchorage safer, but up to June 30 a contract had not been entered into.

The work proposed is to extend 320 feet in from 6 inches to 2½ feet at extreme low water. It is to be of cribwork, 14 feet in width on top, fully ballasted, close fendered on the seaward side, and protected on the seaward side by a talus of stone sloping 3 to 1 from high water. Spring tides rise 5 feet.

The cost of calling for tenders was \$103.60.

## MALIGNANT COVE.

Malignant Cove, Antigonish county, is situated on the southeastern shore of Northumberland strait, about midway between Arisaig and Georgeville, and distant about 4 miles from each.

The sum of \$5,000 was voted for expenditure during 1899-1900 towards opening a channel for boats through the gravel beach, into a small pond at the head of the cove, and in constructing channel protection works. A plan and specification for works extending outward to 7 feet at low water springs were prepared, and the sum of \$3,893.35 was expended in procuring the materials required for the construction of the protection works.

The work proposed included the construction of piers, placed 60 feet apart, on either side of the channel, which was to be excavated to a width of 30 feet in the bottom and to a depth of 2 feet below low water. The piers extending 248 feet inwards through the beach, from low water outside, to be 10 feet wide on the top and founded at low water; those extending from low water outwards to be 16 feet wide on the top over 60 feet from their inner ends, and 22 feet wide over the outer 30 feet. All cribwork was to be built of round native timber, laid open-faced, fully ballasted and close-sheathed at the ends and on the channel faces.



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In 1900-1 the sum of \$6,123.64 was expended in the construction of the outer piers, each 90 feet in length, and of a portion of the inner pier on the eastern side of the channel, 188 feet in length.

During 1901-2 the sum of \$2,464.85 was expended in completing the work proposed, and in the construction of a cribwork extension to the western inner pier, 60 feet long and 10 feet wide, to prevent the re-opening of the old channel through the beach.

During the last fiscal year the inner end of the western pier, which for a distance of 70 feet was built lower than the outer portion, was raised to the same level, a height of 2 feet; and beach protection works were constructed on the eastern side of the eastern pier, to prevent the sea from washing over the beach and carrying sand into the channel between the piers. These works consist of a cribwork block, 40 feet long, 12 feet wide, and averaging 10 feet in height, and of an extension of piles, brush and stone, 50 feet in length.

The expenditure for the fiscal year was \$799.94, and the total expenditure to June 30, 1903, is \$13,281.78.

#### MAITLAND.

The village of Maitland, Hants county, with a population of about 1,500, is situated on the west side of the mouth of the Shubenacadie river, which enters Cobequid bay on its south side. The bay is the eastern extension of the basin of Minas, a large and important estuary of the Bay of Fundy. A public wharf was built here by the department between 1873 and 1876 at a cost of \$6,342, and a further sum of \$2,142.76 has been expended for repairing this structure. Communication with Truro, the county town of Colchester county, is by public road, but the Shubenacadie river, at this point over half a mile wide, must be first crossed by means of a ferry available the year round, except for the few winter months. On the Hants side the ferry boat has always landed on the beach, and at low water, considerable trouble is experienced in getting passengers and teams to and from the ferry boat. To facilitate the crossing of the river, the department expended, during the year 1897-8 the sum of \$996.76 in constructing a ferry wharf of cribwork, 170 feet long and 20 feet wide. In the year 1898-9 the sum of \$202.45 was expended in finishing the work, or rather in extending the inclined slip a further distance of about 50 feet, so as to take it out to the level of the beach in order that the horses and teams might be driven from the beach on to the wharf. The work is partially an extension and reconstruction of an old private wharf, but its location at the foot of a public street makes it entirely a public work.

In 1902-3, the sum of \$1,398.61 was expended in renewing the whole top of the shipping wharf, including stringers, planking and guards; also, in raising the outer north-east corner of the L a height of two feet, to make up an ancient settlement.

The total expenditure on the shipping wharf up to June 30, 1903, is \$9,884.36.

#### MARGAREE.

Margaree Harbour, at the mouth of the Margaree river, Inverness county, is on the west coast of Cape Breton Island, about 30 miles north-east of Port Hood. It has a narrow, intricate channel through which the tide runs at the rate of four knots, and its entrance is obstructed by a bar of shifting sand, over which there is, at times, a depth of only 5 feet at extreme low water.

Expenditures have been made by the department in the construction and maintenance of channel protection and improvement works on the west side of the entrance, and in the construction of beach protection work on the east side.

The works on the west side include works built by the provincial government and extended by the department, and works of improvement undertaken in 1900-1.



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The old provincial government works (reconstructed by the department) extend 40 feet from the shore, across what was originally a false channel, to a large rock opposite the inner entrance and thence, at right angles, to the edge of the channel.

The work built by the department extends from the north side of the outer provincial government works outwards, along the west side of the channel 595 feet. It is in four sections: 85 feet (built in 1876), 130 feet (built in 1879), 200 feet (built in 1890), and 180 feet (built in 1899), respectively 18, 16, 18 and 20 feet in width on top, and 15, 14, 12 and 16 feet in height. Each section is of round timber, open-faced, and is fully ballasted and close fendered at the sides and outer ends. The top of the covering is from 4 feet 4 inches to 5 feet above extreme high water. The depth, at extreme low water, along the channel face, originally varied from 7 to  $2\frac{1}{2}$  feet. Spring tides rise 4 feet.

The improvements undertaken in 1900-1, but not completed, were the deepening along the channel face of the extension to 8 feet at low water over a distance of 200 feet; and the construction of a shear-dam within the entrance, 180 feet in length, including 25 feet of brush and stonework 11 feet wide on top, 100 feet of pile and brushwork 10 feet wide, and 55 feet of cribwork 22 feet wide founded on brushwork in from 1 foot 3 inches to 9 feet 9 inches at extreme low water. During the year 1900-1 the sum of \$3,695.30 was expended, \$400 in repairing the channel face of the outer provincial government work; \$1,796 in procuring materials and constructing the brush and stonework, the pile and brushwork, and the substructure of the cribwork of the shear-dam, and \$1,499.30 in about one-half the rock excavation required to give 8 feet at low water along the channel face of the extension.

In 1901-2 the sum of \$3,065.57 was expended, \$995.78 in completing the shear-dam, with the exception of making a roadway over the brush and stone at the inner end, and \$2,069.79 in completing the sub-marine work excavation with the exception of the removal of a small quantity of excavated material at the inner end of the cutting, and of some points of ledge rock over which there is a depth of only 6 feet 9 inches at extreme low water.

Of the \$500 appropriated for 1902-3, the sum of \$482.32 was expended: \$219.41 in completing the shear-dam, \$61.82 in continuing the channel face rock excavation, and \$201.09 in repairing and improving the channel protection works.

The total expenditure to June 30, 1903, including \$3,378 expended in beach protection works (east side), and a refund of \$274.83 to the provincial government, is \$28,027.77.

## MCNAIR'S COVE.

McNair's Cove, Antigonish county, is on the west side of St. George's bay, about 2 miles to the southward from Cape George.

A breakwater 400 feet in length and 20 feet in width was built on the north side of the cove during 1872-3-4, and in 1878 a length of 20 feet was added thereto. In 1879 the work was carried away by drift ice to within 100 feet of the shore end down to from 3 to 6 feet below low water. During the summer of 1883, 70 feet of the shore end was rebuilt, and during the winter of 1884 the work was extended 94 feet. In April, 1884, the 94 feet extension was badly damaged by drift ice, and was subsequently carried away.

During 1886-87-88 the bottom of the damaged work was dredged out, and a work 160 feet in length, 34 feet wide on top, with a sloping face on the seaward side, was constructed, and on its completion the total length of the breakwater was 330 feet.

The work was constructed entirely of native timber, and as it became much weakened by the action of the teredo, during 1890-91-92-93-94, the outer end and on each side of it, for a distance of 20 feet, was protected by creosoted timber close-piling, and its seaward face by talus of quarried stone.



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During the years from 1897 to 1901 the timber wall, under the sloping face, which was destroyed by the teredo was renewed down to low water and close-sheathed with large hardwood timber, the stone talus was raised up to the top of the sheathing, and the work was re-ballasted and re-covered where necessary. Further, the mouth of a small brook, at the head of the cove, which was continually shifting to the detriment of the boat landing, was made permanent by the construction of a shear-dam of brush and stone.

During 1901-2, the sum of \$1,197.17 was expended in placing 80 cubic yards of very large stone on the talus, and in procuring the materials required for widening and repairing the inner end of the work, which was built in 1872 and was only 20 feet wide.

Out of the amount voted for expenditure on this work during 1902-3, the sum of \$1,094.58 was applied in reconstructing and widening the inner end of the breakwater, for a distance of 120 feet and to a width of 30 feet, the materials for which were procured during the previous year; and in placing about 85 cubic yards of large stone on the talus along the seaward face of the work.

The work at the outer end is 20½ feet high, 4 feet above high water springs, and the depth of water at the outer end at low water springs is 12 feet. Spring tides rise 4 feet; neaps, 2 feet.

The total expenditure up to June 30, 1903, including dredging, is \$68,357.32.

#### METEGHAN.

Meteghan, Digby county, is situated on the south side of St. Mary's bay, 25 miles north of Yarmouth, 20 miles south of Weymouth, 2½ miles from Meteghan river, and 40 miles from Digby, the county town. The nearest railway station on the Dominion Atlantic Railway which lies approximately parallel to the coast, and has its terminus at Yarmouth, is about 7 miles distant. The whole coast of St. Mary's bay, from Digby to Yarmouth, is thickly settled, and is, in fact, almost one continuous straggling village for the whole distance of 67 miles.

Meteghan, next to Digby and Yarmouth, is the largest and most important settlement on the bay shore, having a population of 1,000 people, engaged in farming, fishing, lumbering and general trade.

The harbour works consist of a breakwater and landing pier, built of cribwork, between 1837 and 1860 by the provincial government and the inhabitants. The pier is about 300 feet long and 20 feet wide; the breakwater, 20 to 26 feet wide, runs out a distance of 925 feet from the shore, and has a return or **L** of 85 feet at the outer end, which is 24 feet wide and 30 feet high, standing in from 25 to 27 feet depth at high water O. S. T.

In 1875, at which date the work appears to have been taken over by the department, the breakwater was extended and repaired.

In 1878 an additional length of 100 feet was built with a portion of the **L** at the outer end, at a cost of \$3,000, and in 1881 the sum of \$2,250 was expended in still further extending the structure by building an additional length of 50 feet on the **L**. In 1882-3 the sum of \$500 was expended in reballasting and close-piling portions of the work and in other miscellaneous repairs. In 1883-4 \$32 was expended in securing some of the fenders and a portion of the flooring at the outer end. In 1884-5 some damage caused by a severe gale of the previous November was made good at a cost of \$96.64; a breach 25 feet long and from 4 to 6 feet deep was closed with solid work; 40 feet of new break was added, and some new ballast put in to replace that washed out. In 1887-8 the seaward face of the breakwater was close-sheathed for 700 feet in length, 575 feet of the inner face was repaired and sheathed, the whole work levelled up and some minor repairs executed; the expenditure in the said year was \$1,447.33, which in the departmental report for the year is given as a refund to the provincial government on account of moneys expended by them between 1867 and 1879. In 1892-3



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the department expended the sum of \$299.72 in making slight repairs to the breakwater and in temporary repairs to the landing wharf. In 1893-4 the sum of \$2,627.54 was expended in making thorough repairs to the landing pier and wharf, the work done consisting of rebuilding and face fendering of the outer block 50 feet in length, building a new top and back 8 feet thick to the next length of 16 feet, and thoroughly refendering and capping the remainder of the work a length of 260 feet.

In 1897-8 the sum of \$3,141.99 was expended in constructing a re-enforcing block along the whole length of the outer face of the L of the main breakwater. This work which was rendered necessary by the eating away of the bottom timbers by the limnoria, and the consequent settlement of the breakwater, is 100 feet long, 12 feet wide and 22 feet high. The upper portion of the L was also built 35 feet wide and 4 feet high, which restored it to the height of the present work. The new work is well and substantially built of round-log cribwork, well fendered, ballasted and close-sheathed on all exterior faces. In 1898-9 the sum of \$1,093.20 was expended in renewing a length of 120 feet, by 8 to 10 feet in height, and by 8 to 10 feet in width, of the lower portion of the outer end of the seaward face of the breakwater, which had been eaten away by the limnoria; the work close-sheathed for the same distance, and for 40 feet on the inner side; about 10 feet in length of the flooring was renewed. A breach 30 feet long on the seaward side, adjacent shorewards to the 120 feet before mentioned, was also closed up. In the fiscal year 1899-1900 the sum of \$2,000 was expended in extensive renewals and repairs to the breakwater, the work done consisting of the rebuilding of 100 feet in length of the seaward face and 90 feet of the inner or shoreward face, about 8 feet wide from top to bottom of the work, placing top cross-logs all across the breakwater to tie the new portions together, and a new floor on the portions renewed.

In 1900-1 the sum of \$3,499.95 was expended in rebuilding a serious breach made in the work by a severe gale in March, 1900. The new block, which had to be built from the bottom, is 180 feet long, 22 feet wide and from 18 to 22 feet high. In addition to this, a length of 221 feet of the top of the breakwater was refloored and partly close-sheathed, the floor having been destroyed by the storm referred to.

In 1901-2 the sum of \$3,199.93 was expended in continuing the restoration of the breakwater that had been going on for the last three or four years. The work done consists of a piece 138 feet long, in about the middle of the length of the wharf, being taken down and rebuilt. Of the next 200 feet shorewards the northern face was taken down and rebuilt 10 feet wide.

In 1902-3 the sum of \$2,999.47 was expended in completing the rebuilding of a piece in the middle of the breakwater, 123 feet long, 20 feet wide on top and from 9 to 11 feet high, that had been destroyed by a violent gale in the winter of 1901-2.

Spring tides rise 21 feet; neaps, 17 feet.

Total expenditure to June 30, 1903, is \$36,449.85, including a refund to the provincial government of \$1,447.33 in 1887-8.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.

## METEGHAN RIVER.

Meteghan river, Digby county, empties into the Bay of Fundy at the mouth of St. Mary's bay, almost directly opposite Grand Passage, between Long island and Brier island. The village at the mouth of the river is 20 miles south of Weymouth, 28 miles north of Yarmouth and  $2\frac{1}{2}$  miles north of Meteghan or Meteghan Cove. The population of the village is about 400 people, engaged in farming, fishing, lumbering and general trade. The nearest railway station, on the Dominion Atlantic Railway, which runs parallel with the bay shore, is about 4 miles from the village. On the river, which is about 18 miles long, are some 20 sawmills, most of which send lumber down to the mouth of the river for export to the West Indies and the United States, the total amount of the output aggregating over a million feet B.M. annually. The



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works here, which were built some years before confederation, presumably at the joint expense of the provincial government and the inhabitants, consist of 2 breakwaters, 1 on either side of the mouth of the river, and inclosing an area of about 3 acres, in which, at H.W.O.S.T., is a depth of 10 to 15 feet, giving ample berth accommodation and complete shelter to a large number of coasting and fishing vessels.

The north breakwater is about 400 feet long, 24 feet wide and 13 feet high at the outer end. Both breakwaters are built of stone-filled cribwork of the usual type. When the work came under the charge of the department the older portions were much decayed, and extensive repairs were needed, which were made in 1873, at a cost of \$4,500. In 1881-2 the sum of \$2,000 was expended in rebuilding and repairing parts of both breakwaters. In 1882-3 the sum of \$3,000 was expended in close-piling and extending the south breakwater a length of 80 feet, in general repairs to the north breakwater, and in removing from the dock a quantity of rocks and boulders, which were used as ballast in the new work. In 1890-1, \$265.19 was expended in removing from the channel, near the shore end of the south work, more rocks and boulders, that interfered with the keels of vessels lying alongside; slight repairs were also made under the same appropriation to both breakwaters. In 1898-9 the sum of \$4,110.76 was expended in extensive renewals to the shore end of the south breakwater; the work taken down and rebuilt was 400 feet long, with an average width of 29 feet and average height of 19 feet. This length was also newly close-sheathed, and on the shoreward side of the same portion a new break was built, 276 feet long and 6 feet high. In the fiscal year 1899-1900 the sum of \$4,199.98 was expended in continuing the work of restoration of the main breakwater, a length of 216 feet of the shore end of the work, adjoining outwardly the portion of the work renewed the previous year, was taken down and thoroughly rebuilt.

In 1900-1 the sum of \$8,848.55 was expended in continuing the restoration of this work begun in 1898-9, and in removing gravel from the bottom of the stream between the two breakwaters; 184 feet in length was taken down and rebuilt from the bottom, an average width of 27 feet, and from 18 to 19½ feet high. The next 213 feet shorewards, which was rebuilt the previous year, was floored, including stringers, caps and plank.

In 1901-2 the sum of \$3,999.99 was expended in continuing the work of restoration begun in 1898-9. The outer 113 feet in length of the work was rebuilt practically entire. In order to straighten the outer block of the work it was widened 24 feet at the outer end, the new block tapering to nothing 83 feet shorewards from the outer end. 83 feet in length also of the outer end of the work was close-piled on the north side to protect it against scour by the river which issues at this side. A considerable quantity of gravel was also removed from the river channel to improve the approach to the wharfs. In 1902-3 the sum of \$942.41 was expended in completing repairs and renewals to the breakwater in progress during the past two seasons. The work done includes the renewal of the upper portion of the outer end of the breakwater and in deepening the river channel alongside the outer end of the work.

Spring tides rise 21 feet; neaps, 17 feet.

The total expenditure to June 30, 1903, is \$35,731.89. This work was transferred to the control of the Marine and Fisheries Department on June 12, 1888.

#### MONK'S HEAD.

Monk's Head, Antigonish county, is situated on the southern shore of St. George's bay, between the harbours of Antigonish and Pomquet. A large sheet of water to the westward of Monk's Head, known locally as Dun's lake, is separated from the bay by a beach of sand, and from Antigonish harbour by a neck of marshy land.

During the years 1894-5-6, a channel for boats was opened between Dun's lake and Antigonish harbour, and a highway bridge was constructed over it at its western end.



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The channel was about 700 feet in length, and was cut down to the level of low water springs, and had a width of about 4 feet at the bottom, with sides sloping about  $\frac{1}{2}$  to 1.

Owing to the soft nature of the bottom, soon after the completion of the work, the strong tidal currents deepened the channel, cut into the slopes and undermined the bridge abutments, causing them to settle, and it was found necessary to widen the bridge opening, to protect the faces and sides of the bridge abutments with piling, and the sides of the cut with brush and stone for a distance of 215 feet on the northern and 240 feet on the southern side.

During 1900-1 the sum of \$399.96 was expended in repairing the brush and stone protection, and in securing it in place by front and rear posts, solidly driven and secured together by cross-ties and longitudinal walings.

During the last fiscal year the bridge abutments and the channel protection works were strengthened and repaired at a cost of \$139.07.

The total expenditure to June 30, 1903, is \$1,833.05.

## MINUDIE.

Minudie, Cumberland county, is a small village of about 250 or 300 inhabitants, situate at the head of Chignecto channel, and at the mouth of the River Hébert, about 6 miles north of the village of River Hébert. The chief occupation of the people is farming, and the facilities for landing goods and shipping their produce, chiefly hay, were practically *nil* previous to the construction of the new government wharf. The salmon, shad and haddock fisheries are also quite extensively engaged in by some of the people. The construction of a public wharf at this place to afford the necessary landing and shipping facilities was commenced in 1901-2, in which year a sum of \$1,816.63 was expended and a further sum of \$1,310.51 was laid out in 1902-3 in completing this wharf, bringing its total cost to \$3,166.17. Great difficulty was experienced in procuring timber and stone for this wharf, which entailed much extra expense. The wharf as completed consists of an approach 123 feet in length, 16 feet wide on top and 9 feet high at the outer end. The wharf proper is 75 feet long, the first 50 feet from the approach, outwardly, being 20 feet wide on top and the outer 25 feet 65 feet wide; the outer face has a height of 32 feet from end to end. It is built of continuous, round-log stone-filled cribwork, well fendered and bolted; the ballast is hand-packed to the underside of the floor-stringers. The approach is constructed in the form of a rock bank, with side walls about 4 feet thick, composed of large stones, whilst the centre is filled in with smaller stones, the whole being neatly gravelled to a depth of 6 inches with good coarse gravel.

## NECUM TEUCH.

Necum Teuch (pronounced 'Necumtau'), Halifax county, is the name given to the settlement lying on the east side of Necum Teuch bay, at the mouth of Moser's river. It is 68 miles in an air line E.N.E. from Halifax, and 6 miles from Salmon River. The population of the place embraces about 400 people, engaged in farming and lumbering. About 2,000,000 feet of deal and hardwood are sawn annually at Moser's river, at the head of the bay. A small coasting steamer makes weekly calls, landing freight and passengers at a detached block of cribwork in the stream, whence they are transferred in small boats to the settlement.

In 1902-3 the sum of \$790.13 was expended in commencing the construction of a wharf. The work done for this small expenditure consists of a road approach, about 500 feet in length, constructed of earth embankment, and about 70 feet in length of cribwork at the shore end of the wharf. (To complete the work to its designed and necessary length will cost about \$4,200.)



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## NEIL'S HARBOUR.

Neil's Harbour, Victoria county, is situated on the eastern coast of Cape Breton island, about midway between Ingonish and Aspy bays.

The harbour is at the entrance of a small bay, open to the south and south-east, and extending inland about half a mile. It is sheltered from the north and east by Neil's Head (a rocky promontory, from 10 to 20 feet above the level of high water springs), but not safe during gales from the south and south-east.

It is a large and important fishing station, and for the purpose of affording protection to the anchorage during south-easterly gales, on May 29, 1901, a contract was entered into for the construction of a breakwater off the southern end of Neil's Head, extending into 17 feet depth at low water, and the work was completed in a satisfactory manner on May 29, 1903.

The expenditure during the fiscal year 1902-03 was \$13,892.50.

The work as completed includes a breakwater 226 feet in length, and a road cutting through the bank, 79 feet long and 20 feet wide at the bottom. The breakwater, excepting the inner end for a distance of 44 feet, which is of round native timber cribwork, consists of close-faced squared timber cribwork, 20 feet wide for a distance of 114 feet from the inner end, 24 feet wide for a further distance of 80 feet, and 56 feet wide for the remaining 32 feet. The work is very strongly constructed, is filled in solid with ballast, and is close-sheathed on the seaward faces, the outer end and on the inner face for a distance of 112 feet from the outer end. The substructure is of creosoted timber, and the seaward face is protected by a stone talus from high water down sloping  $2\frac{1}{2}$  to 1.

Spring tides rise 4 feet.

The total expenditure on this work is \$17,349.94.

## NEW CAMPBELLTON.

New Campbellton, Victoria county, is at the head of Kelly's cove, on the northern side of the Great Bras d'Or channel, about one mile from its entrance into the Atlantic ocean.

The cove is about half a mile in width at the mouth, and a quarter of a mile in depth, and has a depth of water of about 20 feet at low water. It is sheltered from all winds except south-westerly, but as these blow down the channel they do not cause much inconvenience.

It is the shipping place of the Cape Breton Coal Mining Company, and a large amount of coal is shipped here annually. Owing to the want of a proper and permanent ballast ground the ballast is often deposited by the vessels where most convenient to them, without due regard to its damaging effects, and in consequence the depth of water in the cove is said to have been reduced.

The sum of \$5,000 was voted for expenditure during 1902-3 in the construction of a ballast wharf. A plan and specification for a work estimated to cost \$11,500 were submitted to the department on December 17, 1902, but up to the end of the fiscal year tenders for its construction had not been called for.

## NEW HARBOUR.

New Harbour, Guysboro' county, is on the southern or Atlantic coast of Nova Scotia, 30 miles to the westward of Canso harbour. It is merely a shallow bay, open to the south-east, at the head of which is the entrance to St. Catherines river, navigable for boats 5 miles inland.

A contract, entered into in May, 1900, for the construction of a breakwater at Black Point, on the western side of the bay, was completed September 27, 1900.



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The breakwater consisted of a stone embankment 160 feet in length and 7 feet in average height, between the shore and 'Black Rock,' a stone embankment 89 feet in length and 18 feet in average height, in extension of 'Black Rock;' and 150 feet of cribwork 25 feet in width, with creosoted substructures, and with a talus on the seaward side sloping  $1\frac{1}{2}$  to 1 from high water.

The height of the cribwork over 15 feet of its width on the seaward side is 7 feet, and over 10 feet of its width on the inner side 3 feet 4 inches, above extreme high water. The depth, at extreme low water, at the inner and outer ends of the cribwork are respectively 6 and  $16\frac{1}{2}$  feet. Spring tides rise 6 feet.

During a southerly gale in October, 1900, the outer section of stone embankment was nearly destroyed, the cribwork was slightly damaged, and most of the stone in the talus on the seaward side of the cribwork was carried away.

In 1901-2 the sum of \$3,693.04 was expended in repairing the cribwork, and in strengthening it by placing a second 6-inch covering over the covering of the inner 10 feet; in constructing concrete walls, 89 feet in length, 12 feet in width, on top, and 10 feet in average height over the remains of the outer embankment, and 75 feet in length, 8 feet in width and 4 feet in average height over 'Black Rock;' and in slight repairs to the inner embankment.

During the fiscal year ended June 30, 1903, the sum of \$5,999.77 was expended in repairing 50 feet of the concrete work between 'Black Rock' and the cribwork, by placing concrete where undermining had taken place; in reconstructing about 30 feet of the outer end of the stone embankment between the shore and 'Black Rock,' and in placing a talus of heavy stone (5 to 8 tons) on the seaward side of the outer concrete work and of the cribwork extension.

The total expenditure to June 30, 1903, is \$27,163.55.

## NORTH RIVER.

North river, Victoria county, empties into the northern arm of St. Ann's Harbour, a fine basin, 7 miles in length and about 2 miles wide with a great depth of water, at the head of St. Ann's bay, on the eastern coast of Cape Breton Island.

The wharf constructed by the department at Seymour's Point, on the northern side of the mouth of North river, during 1898-99, 1900, consists of a road approach 64 feet long and 16 feet wide, of a block and span work 63 feet in length, 20 feet wide, and of a pile extension, 175 feet in length and 20 feet wide, with a return of 20 feet at its outer end. The depth of water at the outer end at low water, is about 9 feet.

All the bearing and mooring plies in the pilework were to be of creosoted timber, excepting the piles in the three inner bents, which being driven above the level of low water, and considered safe from the attacks of the teredo, were to be of spruce, but as there was a shortage of creosoted piling in the cargo received, and none could be obtained in the island, the contractors were permitted to substitute native timber piling for three further bents at the inner end.

An examination of the wharf made on January 27, 1903, showed that some of the native timber bearing piles had been cut into by the teredo, and that the others were much weakened and in order to make the wharf available for traffic until it could be properly repaired, the sum of \$45.88 was expended during the fiscal year in replacing posts under the pile-caps in the six inner bents of the wharf, to take the strain off the damaged piles.

The total expenditure to June 30, 1903, is \$2,409.43.

## NYANZA.

Nyanza, Victoria county, is a settlement situated between Middle and Baddeck rivers, on Indian bay, on the northern side of St. Patrick's channel, an arm of the Bras d'Or lake, and 7 miles to the westward of Baddeck, the shiretown of the county.



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It is a port of call for the steamers of the Bras d'Or Steam Navigation Company, which ply daily during the season between the Sydneys and Whycocomagh, and is the shipping place for a large agricultural district.

During the years 1893-94-95 a wharf was constructed, 136 feet long and 20 feet wide, with an L at the outer end 20 by 20 feet, and a road 153 feet in length was built to connect it with the public road. The wharf is constructed of brush, with faces battering 1 to 6, and is covered with gravel.

As it was found that the wharf had not sufficient surface area to accommodate the business of the locality, during 1901-2 the sum of \$890.29 was expended in widening the inner end of the wharf to the width of the outer end, viz.: 40 feet, by brush work, and new fender piles, chocks and cap timbers were placed on the old work, and the top as well as the approach were newly gravelled.

During the last fiscal year the sum of \$257.79 was expended in the construction of a warehouse, 30 feet long by 18 feet wide with 10 feet posts, on the inner end of the wharf. The roof and the sides of the building were shingled, and the whole of the outside painted with red metallic paint.

The total expenditure to June 30, 1903, is \$3,091.23.

#### OGDEN'S POND.

Ogden's Pond, Antigonish county, is on the western shore of St. George's bay, about 13 miles south from Cape George and 9 miles from the town of Antigonish. It is a small sheet of water, about 100 acres in extent, separated from the bay by a sand beach of from 130 to 250 feet in width.

For the purpose of rendering the pond, which has a depth of over 10 feet at low water, accessible to boats and small crafts, during 1900-1-2 a channel 30 feet wide and about 825 feet in length was cut through the beach, down to a depth of about  $1\frac{1}{2}$  feet below low water, and a channel protection work, 350 feet in length, was constructed on the northern side of the entrance. The work consisted of: a brush and stone embankment 70 feet long and 8 feet wide on the top, with sides sloping  $\frac{1}{2}$  to 1; a pile, brush and stone work, 260 feet long and 10 feet wide from outside to outside of pilework, close-sheathed on the seaward face; and of a round-timber cribwork block at the outer end, 20 by 20 feet on top, with sides sloping 1 in 8, with creosoted timber substructures and close-sheathed on all outer faces.

During the last fiscal year the sum of \$649.87 was expended in repairing and levelling up the outer block, which had settled by undermining of the sandy foundation, and in protecting its base with brush and stone; also in replacing stone in the top of the pile, brush and stone work, which, being uncovered, had been washed out by the sea.

The expenditure on this work to June 30, 1903, is \$4,333.89.

#### PARKER'S COVE.

Parker's Cove, Annapolis county, is a small indentation on the south-east shore of the Bay of Fundy, 15 miles north-west of Digby Gut, and 7 miles north of Annapolis, the county town. The population of the settlement is about 250 people, engaged in farming and fishing.

In 1883-4 the department constructed a small breakwater, which was substantially built of round-log cribwork, stone-filled, 200 feet long,  $23\frac{1}{2}$  feet to 26 feet wide on top, and at the outer end 16 feet high, where at high tide there is a depth of about 11 feet of water.

In 1900-1 the department extended the breakwater a distance of 101 feet, at a cost, by contract, of \$3,749. The new block is 26 feet wide on top, and from 16 to 19 feet high, substantially built of round-log cribwork, filled with ballast, well fendered and close-sheathed on the seaward side and outer end.



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In 1901-2 the sum of \$73.50 was expended in placing a quantity of large stone on the eastern side of the breakwater, near its outer end, to prevent the waves from undermining the work.

In 1902-3 the breakwater was extended a further length of 130 feet, with an L on the outer end, having a face length of 82 feet. The work, which was built by contract at a cost of \$10,212.60, is from 25 to 29 feet high, the stem 26 feet wide and the L 30 feet wide on top. The landward side batters 1 in 6, while the eastward side is plumb and provided with a solid timber break 4 feet 6 inches high. The work was begun on June 11, 1902, and the whole work thoroughly well completed on November 20 of the same year. The extension is very strongly built of round-log cribwork, filled to the top with stone ballast, well fendered and bolted and close-sheathed on the seaward face.

Spring tides rise about 30 feet.

The total expenditure to June 30, 1903, is \$16,327.14.

## PEREAUX.

Pereaux, King's county, is a rich and prosperous agricultural district, with a population of some 300 or 400 people, situated on the west side of the basin of Minas, 3 miles north of Kingsport and 5 miles south of Cape Blomidon. From Kingsport to Cape Blomidon is a thickly settled and fertile agricultural and fruit-growing district.

In the fiscal year 1901-2 the sum of \$661.99 was expended in the partial construction of a pile wharf for the purpose of shipping fruit, farm produce, &c., and the landing of coal and general merchandise. It was satisfactorily completed in the year 1902-3 at an expenditure of \$1,329.96. The wharf is a pile structure, 180 feet long, 25 feet wide, and at the outer end 20 feet high, where at high water there is a depth of 17 feet.

Total expenditure up to June 30, 1903, \$1,991.95.

## PETIT DE GRAT.

Petit de Grat inlet, Richmond county, lies between Petit de Grat island and the eastern extremity of Island Madame. The main entrance is at the southern end from the Atlantic; the northern entrance from Rocky bay is obstructed by outer and inner bars, through which passages for boats at ordinary low water were opened by the department between 1879-82.

During 1898-99-1900-1 both channels were widened and improved by hand dredging, and a cribwork protection was constructed on the western side of the outer channel.

At the end of June, 1901, the outer channel was about 350 feet long and 25 feet wide, with a depth of 2 feet at low water, while the inner was 285 feet long, 20 feet wide, and with the same depth as the outer channel. The protection work, 298 feet in length, and constructed of ordinary round timber, was fully ballasted but not covered.

The sum of \$1,000 was voted for expenditure during 1901-2, in the reconstruction of a portion of the protection work and for deepening the channel; but as it was found that the beach on the eastern side of the outer channel was moving rapidly to the westward, and had already encroached upon the channel, and the amount authorized was not sufficient to check the movement, the amount was not expended; and it was decided to abandon the old work and to open a new channel to the eastward of it.

The sum of \$2,600 was appropriated for expenditure during 1902-3 in opening the new channel, and for protecting its eastern side by cribwork.

Of the amount appropriated, the sum of \$90.91 was expended in procuring part of the timber required for the construction of the channel protection work.



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The proposed channel will be about 500 feet to the eastward of the old one, and is to be 285 feet long, 20 feet wide at the bottom with sides sloping 3 to 1, and excavated to a depth of 2 feet below low water; and the protection work is to be 200 feet in length, 12 feet wide for a distance of 160 feet from the inner end, and 20 feet wide for the outer 40 feet, constructed of round timber cribwork, fully ballasted and fendered, the outer 40 feet covered with plank, and the eastern face, the end and the western face for a distance of 40 feet from the outer end, are to be close-sheathed.

Spring tides rise 6 feet.

The total expenditure on this work to date is \$6,166.36.

#### PICTOU ISLAND.

Pictou island is situated in the Strait of Northumberland, about 10 miles north-east of the entrance to Pictou harbour.

There are two wharfs on the south side of the island, one near the west end and one, known as the 'East wharf,' near the centre. The west wharf is 324 feet in length and 20 feet in width (with the exception of the inner 55 feet, which is 12 feet wide), and had an L on the east side at the outer end which measured 20 by 30 feet previous to its enlargement in 1902-03. The east wharf is 328 feet in length and 20 feet in width. The depth at extreme low water at the outer ends of the east and west wharfs are respectively 4 feet 6 inches and 4 feet 9 inches. Spring tides rise 6 feet.

In 1901-2 the sum of \$609.60 was expended in repairing the east wharf.

During the fiscal year ended June 30, 1903, the sum of \$942.56 was expended in repairing and strengthening the west wharf. The floor stringers and covering of the outer end were renewed, and a 30 by 20 foot block was placed at the outer end of the L.

The total expenditure to June 30, 1903, including the refund of \$400 made to the provincial government, is \$13,112.44.

#### PIPER'S COVE.

Piper's Cove, Cape Breton county, is on the north-east end of the Great Bras d'Or lake, between the entrance to East bay and Barra strait.

The cove is open from south to west, the heaviest seas being from the south-west, where they have a rake of 12 miles. At the head of the cove there is a small pond, separated from the lake by a beach of sand about 100 feet wide and 4 feet high above lake level.

As the sum of \$500 granted for expenditure during 1902-3 for a boat harbour was found to be entirely too small to construct any work of a practical character, particularly as the teredo is very destructive in the lakes, and creosoted timber would have to enter largely into the construction of any work there, the amount granted has not been expended.

A report on the construction of a work, such as desired by the inhabitants, was submitted in February, 1903.

#### PINCKNEY'S POINT.

Pinckney's Point, Yarmouth county, is a small fishing and farming village of about 150 people, situated near the extremity of the headland between Chebogue river and Little river, about 12 miles S.S.W. of the town of Yarmouth.

In 1901-2 the department expended the sum of \$998.73 in constructing a small breakwater for the purpose of affording some small measure of protection to the fishing boats, and to serve also as a landing wharf for an occasional schooner load of general merchandise for local consumption.



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The work consists of a block of round-log cribwork, 20 feet square, 14 feet high, with an approach 93 feet long, 20 feet wide and from 4 to 13 feet high, built of stone and walled up on each side with split boulders. The outer edge of the crib-block is at low water mark.

In 1902-3 the sum of \$48.69 was expended in flooring the block of cribwork 20 feet square, built the previous year and the placing of 8 fenders.

Spring tides rise 12 feet, neaps about 11 feet.

## PLEASANT BAY.

Pleasant Bay, Inverness county, is on the western coast of Cape Breton Island, 24 miles north of Cheticamp, and about midway between that place and Cape St. Lawrence.

A survey was made here in October, 1902, and a report with estimate was submitted in November, 1902, in which it was stated that the residents are desirous of having a wharf constructed in place of the boat harbour first applied for.

## PLYMOUTH.

Plymouth, Yarmouth county, is a small but thriving farming and fishing settlement of some 300 people, situated on the west side of Tusket river, near its mouth, about 6 miles south-east of the town of Yarmouth.

A small wharf was built here by the inhabitants, many years ago, for the accommodation of fishing craft and small vessels, loading fish and general farm produce, and landing sea manure. Being so far dilapidated as to no longer serve the public need, the department in 1901-2 expended the sum of \$488.21 in building a new wharf of pile-work, 61 feet long, 25 feet wide and from 6 to 9 feet high, with an approach of gravel-covered embankment 100 feet long.

In 1902-3 the sum of \$97.38 was expended in removing some obstructions alongside, and in completing the road to the pile-wharf built the previous year.

The total expenditure by the department is \$1,045.59.

Spring tides rise 13 feet, neaps about 10 feet.

## PORT GEORGE.

Port George, Annapolis county, is a village of some 400 people situated on the south shore of the Bay of Fundy, 37 miles north-east of Digby Gut, 42 miles south-west of Scott's Bay, 6 miles south-west from Margaretville, and 7 miles north-west from Middleton on the Dominion Atlantic Railway.

Some years before Confederation, the provincial government built a western breakwater and an eastern pier or wharf. The breakwater is 440 feet long, from 25 to 35 feet wide on top, and at the outer end, where there is about 21 feet of water at H. W. O. S. T., it is 25 feet high. It is built of round-log stone-filled cribwork, the western or seaward face and outer end being closely sheathed.

The wharf on the eastern side of the little harbour is 205 feet long, 20 feet wide, and 18 feet high at the outer end. It is built of round-log cribwork, and the outer end, on which stands a small lighthouse, is close sheathed. In 1874 the harbour was taken in charge by the Public Works Department, and in that and the following year the sum of \$7,000 was expended in repairing and refacing the breakwater, which was much decayed. In the autumn of 1888, the outer end of the breakwater was destroyed by a severe storm, 165 feet in length being wrecked, and an additional length of 30 feet much injured. Before repairs could be made, a second storm destroyed the damaged portion, leaving 195 feet of the work a complete wreck, and rendering the harbour practically useless. In 1900-01 the destroyed portion of the work was rebuilt by contract.



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In April, 1894, an exceptionally severe north-east gale caused a serious breach in the breakwater at about midway of its length, or immediately shorewards from the new outer block. The breach was 40 feet long for the full width of the work, and about 17 feet high; it was closed in the autumn of the same year.

In 1900-1 the sum of \$400 was expended in repairing the eastern breakwater wharf; the outer 30 feet in length was refloored, and the close sheathing for the same length was renewed. New fenders, guard timbers and mooring posts were also placed. The sum of \$1,653.60 was also expended in the construction of a detached breakwater, lying about 200 feet eastwards from the end of the main work. The object of this is to break the seas, and afford a much needed shelter to schooners lying alongside the breakwater.

In 1901-02 the sum of \$2,297.46 was expended in continuing the construction of the detached breakwater begun the previous year. The work, so far built, is 102 feet long, 32 feet high at the lower end and 26 feet at the upper, 20 feet wide at top. It is plumb on the seaward face, and batters one in four on the back.

In 1902-3 the sum of \$2,287.46 was expended in beginning the construction of an extension of 100 feet in length of this work.

Spring tides rise 30 feet.

The total expenditure to June 30, 1903, is \$31,797.51, including a refund to the provincial government in 1887-8 of \$1,076.75. This work was transferred to the control of the Marine and Fisheries Department on June 12, 1888.

#### PORT GREVILLE.

Port Greville, Cumberland county, is a village of about 300 people, 12 miles west of Parrsboro. Important ship-building and lumbering interests are located in this place, which are mainly dependent upon the security of its harbour. This harbour is formed by a high gravel bar lying parallel to the shore and inside of which the river runs for a half mile before reaching low water mark. For the purpose of protecting this harbour, which was threatened with destruction, the department, in 1874, constructed upon it a cribwork wall 2,200 feet in length with an average height of 7 feet. In 1886-87 a breakwater was built off the eastern end of this cribwork for further protection to the harbour. It is 250 feet long, 21 feet wide on top, with an average height of 20 feet, and has a slope on the seaward end of  $\frac{1}{2}$  to 1, whilst the seaward face and outer end are sheathed with 6-inch plank and well bolted. In 1889-90 the sum of \$2,500 was expended in rebuilding the top of the cribwork wall for a distance of 2,040 feet and to an average depth of 5 feet. A cribwork wall 120 feet in length was also built along the bank of the north side of the mouth of the harbour, to prevent the sea from washing away the gravel bank on that side. In 1902-3 the sum of \$4,071.10 was expended in totally rebuilding the beach protection, which being completely decayed, imperilled the safety of the harbour. The total length rebuilt was 2,004 feet, with a bottom width of 13 feet, a top width of 10 feet and an average height of 7 feet. The material used was excellent, and the workmanship of a high class. It is thoroughly ballasted with stone obtained from the fields and the adjoining cliffs which proved somewhat costly, but on the whole the work was very cheaply built.

#### PORT HAWKESBURY.

Port Hawkesbury, Inverness county, is on the eastern side of the Strait of Canso, nearly opposite Port Mulgrave.

The sum of \$2,000 was appropriated for expenditure in 1901-2 towards the construction of a wharf. During the year a survey was made and a plan and specification prepared for the construction of a wharf known as the 'long wharf.'

A contract was entered into on September 11, 1902, for the reconstruction of the 'long wharf' for the sum of \$9,450.



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The work under contract comprises the construction of an abutment 35 feet in length with end and side walls of stone; the reconstruction from 2 feet above low water of 3,912 feet of block and span work, including 8 cribwork blocks 31 to 38 feet in length, and 22 to 24½ feet in width; and the reconstruction and extension of the 'head,' including the removal to 2 feet above low water, of parts of 2 cribwork blocks and the construction of cribwork and pile 'head' 73 feet 9 inches in line of work by 112 feet.

Construction was commenced April 23, and satisfactory progress was made up to June 30, 1903, when the new cribwork over all the blocks, excepting one, was approaching completion.

The expenditure during the fiscal year 1902-03 was \$2,718.01.

## PORT HOOD.

Port Hood, the shire town of the county of Inverness, is on the west coast of Cape Breton Island, 20 miles north of the northern entrance to the Strait of Canso.

The harbour was formerly a secure one, Smith Island, which forms its west side, having been connected with the mainland by a range of sand hills. In 1839 the sea made a breach through this protection; the opening, at first narrow, was enlarged by the tidal currents with increasing rapidity until it was entirely swept away. The harbour is now unsafe during 'northerly' gales, except in a small cove on the east side of Smith Island.

A pier on the east side of the harbour, commenced by the provincial government in 1865, was originally 550 feet in length and 24 feet in width, with an L on the south side of the outer end, 100 feet in length and 25 feet in width. It came under the charge of the federal government in 1871, since which time extensive repairs and renewals have been made, including the construction of a new block 125 by 25 feet at the outer end in 1873; the construction of a block 50 by 32 feet at the south end of the L in 1888-89, and the construction of a block 71 by 24 feet at the outer end in 1889-90. The old provincial government work was of square timber, close-faced; the additions and parts reconstructed by the department are of round timber, laid open-faced. The piers have been protected on the seaward side, at the outer end, and on the south end and inner side of the L, by close piling, and on both sides to within 74 feet of the outer end, by a stone talus.

During the fiscal year 1902-3, the sum of \$199.99 was expended in urgent repairs, including replacing ballast where required and temporary repairs to the covering.

The total expenditure up to June 30, 1903, including the sum of \$916.11 refunded to provincial government, is \$60,092.19 and \$1,943.60 for dredging.

## PORT LATOUR.

Port Latour, Shelburne county, is a fishing and farming community, situated 25 miles south-west of Shelburne town, with a population of 700.

The harbour is about 4 miles long, north and south, and 2 miles wide, east and west, and has a depth of water of from 5 to 7 fathoms.

Though the outer harbour is somewhat exposed to the south-east (this being the quarter from which the most severe and destructive gales come), the inner harbour formerly afforded some measure of shelter to the northward and eastward of the sand flats, lying between Page's Island and Swain's Point, on which there is from 6 to 8 feet of water at L.W.O.S.T. Since, however, an unusually heavy storm some years ago tore from the flats the thick growth of eel grass with which they were covered the undertow now washes over them. Vessels lying at anchor, awaiting a cargo or a favourable wind, are in danger of dragging ashore, and the need of a protected anchorage is therefore unquestioned.

To most effectually meet this requirement, it was necessary to construct a break-water starting from Swain's Point and running in a north-easterly direction. Dur-



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ing the year 1898-99 the sum of \$3,335.98 was laid out, and during the next fiscal year a sum of \$3,201.87, whilst during the fiscal year 1902-3 the further sum of \$1,009.90 was expended, thus making a total expenditure to June 30, 1903, of \$7,547.79 upon this work. The work done in 1902-03 consisted in the construction of a section of breakwater or rock bank, 62 feet long, which has a width on top of 25 feet and an average height of 16 feet, together with the completion of a former section of similar work, which when work ceased in 1901 was but two-thirds complete, so that practically all the stone work now necessary for this structure is completed. When work is resumed upon this structure it will have to be constructed of continuous round log stone-filled cribwork well fendered and bolted and sheathed, with the top covered with good merchantable 4-inch plank, whilst the logs used in the bottom for 6 to 8 feet in height should be all creosoted timber.

This breakwater as it now stands has a length of 392 feet, a common width of 25 feet on top, with slopes of 2 horizontal to 1 vertical on the seaward side and 1 horizontal to 1 vertical on the harbour side, the height ranging from 10 to 17 feet. The rock bank which constitutes the breakwater is built as follows: An outer shell, 4 feet wide, is formed on both sides of the bank from end to end of its full height, viz., of split boulders of either granite, whin or traprock (a fine masonry stone, very plentiful in this section of the country), and the intervening space between the walls of this shell is filled with smaller stones of from 20 to 300 pounds in weight to within 1 foot of the top, the breakwater being completed with 6 inches of small stones covered with 6 inches of coarse gravel. The joints on the faces of the work are grouted with cement, but the work, though strong and solid, is only of the lowest class of masonry. On the outer or seaward side a break of stone, 2 feet in height, surmounts the structure for its entire length, whilst a rip-rap wall, 5 feet in height, protects the bottom of the outer work. It is estimated that the completion of this work will necessitate an additional outlay of some \$16,000.

#### PORT LORNE.

Port Lorne, formerly called Port William, or Marshall's cove, Annapolis county, is situated on the Bay of Fundy, 32 miles north-east from Digby Gut, and 6 miles north-west from Paradise station, on the Dominion Atlantic railway. The settlement comprises about 300 people, engaged in fishing and farming.

The breakwater was begun in 1835, at the joint expense of the inhabitants and the provincial government, the outlay on the work up to 1867 being \$16,000. The first work done by the Department of Public Works was in 1873-4, when the breakwater was extended a length of 67 feet. In 1882-84 the work was further extended a length of 100 feet, width 35 feet, and height 25 feet. The new block was built close-faced with square timber both inside and outside, and provided with a break 4 feet high. During the next few years several repairs were made. In 1897-8 a re-enforcing block was built on the seaward face and outer end of the breakwater 78 feet long, 27 feet high and 13 feet wide, in addition to other important repairs made.

In 1900-1 the sum of \$2,186 was expended in important repairs. The work done consists of the building, to the full height of the breakwater, of a portion of buttress on the seaward side, 91 feet long; the rebuilding of 12 feet in length of the top of the main work immediately shorewards from the new portion of buttress, and the reflooring of the greater part of the length of 91 feet, abreast of the buttress.

In 1902-3 the sum of \$1,198.48 was expended in rebuilding a portion of the shore end of the seaward face of the breakwater, 50 feet long, 15 feet wide and from 6 to 15 feet high, with solid stone-filled cribwork; also in rebuilding a portion of the break on the shore end, 33 feet long, 8 feet wide and from 6 to 10 feet high.

The total expenditure to June 30, 1903, is \$19,339.11, including a refund to the provincial government of \$1,589.33 in 1887-88.

The work was transferred to the control of the Department of Marine and Fisheries on June 12, 1899.

Spring tides rise 30 feet.



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## PORTER'S LAKE.

Porter's Lake is a long and narrow strip of fresh water, lying nearly north and south, situated about the middle of Halifax county, or about 15 miles east of the provincial capital. It is about 18 miles in length, from a quarter to half a mile in width, and the water being of good depth for almost its entire length, it is navigable for vessels of about 60 tons, to the extreme head. The normal level of the lake is some two or three inches above high water O. S. T., which on the coast here rise 6 feet, and neaps 5 feet.

Up to about 1873 the outlet, which was directly into the Atlantic through a gravel beach, about 200 feet wide, was navigable for schooners drawing 6 feet of water, and a considerable traffic was done then on the lake in the export of timber, lumber, cordwood, general farming produce and fish. Since that time the outlet has been gradually and permanently filling up with the accumulation of gravel washed in by southerly and easterly storms. In order to maintain the outlet, to prevent the roads along the margin of the lake from being flooded, and also to admit fish into the lake, the following small expenditures have been made by the department:—

1881-82.. . . . .	\$ 200 00
1884-85 .. . . . .	200 00
1889-90 .. . . . .	200 00
1892-93 .. . . . .	147 00
1897-98 .. . . . .	100 00
1898-99 .. . . . .	200 00
1899-1900.. . . . .	150 00
1902-03.. . . . .	49 99
	<hr/>
	\$1,246 99

These expenditures have resulted in but slight temporary relief and no permanent improvement, the department, in 1900-01 expended the sum of \$8,262.44, in beginning the construction of a permanent channel through the neck of land, 2,400 feet wide, separating the main body of the lake from the extreme head of Three Fathom Harbour.

In 1901-02 a further sum of \$5,987.24 was expended on the permanent outlet. In 1902-03 the sum of \$2,455.67 was expended on the permanent, and \$49.99 on the temporary (old) outlet.

Total expenditure to date:—

On permanent outlet.. . . . .	\$16,705 35
On temporary outlet.. . . . .	1,246 99
	<hr/>
	\$17,952 44

## PROSPECT.

Prospect, Halifax county, is a settlement of some three or four hundred people, situated on the Atlantic coast, 15½ miles in an air line south-west from Halifax, 21 miles by public road, and about the same distance by water. The land in the neighbourhood being very sterile and rocky and quite unsuited to agriculture, the inhabitants are wholly dependent for a livelihood on fishing, which is an important industry, large quantities of lobster, cod, haddock, mackerel, herring and other fish being caught and exported. The cove, around which the village is built, and which carries a depth of from 10 to 15 feet of water at L. W. O. S. T., is a quarter of a mile long and from two to three hundred feet wide. Its mouth is well protected from the open sea by Saul's Island and by numerous reefs and shoals, so that heavy seas cannot enter. Around the Cove are numerous small, flimsy wharfs and stages, for the landing and curing of fish, but not only is there insufficient depth of water at these stages, but belonging to private individuals, merchants and the general public importing flour, coal and other merchan-



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dise, have in the past been obliged to unload their goods from schooners lying at anchor in the harbour, into boats and get them ashore as best they could.

In the fiscal year 1902-3 the department expended the sum of \$767.26 in the construction of a small wharf of pile-work. On June 30, the wharf was about half finished.

#### RAGGED HEAD.

Ragged Head, Guysboro' county, on the north side of Chedabucto bay, 6 miles east of Guysboro' harbour, is a triangular sheet of water with an area of about 180 acres and a depth of from 2 to 5 fathoms. It is inclosed by shingle beaches, through which there is a narrow channel on the western side of Ragged Head.

During the years 1878-83 the channel was improved and protection works, consisting of 110 feet of cribwork and 428 feet of brush and stone work, were constructed on the southern side. In 1899-1900 and 1900-1 small amounts were expended in repairing the cribwork and in deepening and re-opening the channel.

During the fiscal year 1902-3 the sum of \$1,000 was applied in constructing a cribwork block 49 feet in length, 16 feet in width on top, and 11 feet in height, in extension of the channel protection work and in re-opening the channel.

The total expenditure to June 30, 1903, is \$6,144.97.

The surface of the pond is 3 feet higher (at low water inside) than low water outside; consequently there is a fall at low water of 3 feet in the length of the channel (600 feet). The depth in the channel at low water is about 3 feet, except near the entrance, where it is about 1 foot.

#### ROUND BAY BEACH.

Round Bay Beach, Shelburne county, is about 3 miles east of Negro harbour, and 13 miles south of Shelburne town. The beaches of this bay, which are composed of fine white sand, formed a protection to several small coves on its northern side, which in turn formed small boat harbours of refuge. This fine white sand is continually blowing away and from time to time, breaches are made through the beaches by the many storms which occur along this coast, so that the outlets of these little boat harbours are practically destroyed. The department from time to time have made several small expenditures of \$100 and \$50 in placing brush along the line of the top of the beach to catch this drifting sand. This kind of work has in the past proved temporarily successful, but when the spills become detached from the branches the sand, meeting with but little resistance, escapes from the inclosure and new breaches in the beaches are effected.

During the fiscal year 1901-2 the sum of \$496.74 was expended by the department in repairing the Round Bay Beach works which had been almost utterly destroyed by the previous season's storms. This work was intended to be only a temporary measure of relief, but it did not stand the stress of wind and sea even for a short time, except that small portion of which was constructed of cribwork. It was therefore resolved to continue this cribwork retaining wall the whole length of the beach. This has been done in 1902-3 at a cost of \$2,326.81. The work constructed is 1,400 feet in length, and has a uniform width of 8 feet on top for 1,300 feet in length it is 6½ feet high for the remaining 100 feet, 10 feet. It consists of round-log, continuous, stone-filled cribwork, well bolted and fendered, and the cost of construction was light, being little over 3 cents per cubic foot.

#### SANDFORD.

Sandford, Cranberry Head, is situated on the Atlantic coast of Nova Scotia, at the extreme western point of Yarmouth county, 7 miles north-west from the town of Yarmouth. The settlement in the neighbourhood, which has for some years been known



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as Sandford, has a population of from 300 to 400 people, engaged in fishing and farming.

In 1858 a breakwater was begun by the inhabitants, aided by the provincial government. In 1876 the sum of \$2,000 was expended by the department in extending the work 150 feet. In 1878-9 the sum of \$1,000.08 was spent in constructing an additional length of 50 feet and in repairing the older portions. In 1880 the sum of \$499.95 was expended in repairing the damage done by a storm in August, 1879. In 1883-4 \$100 was expended in re-sheathing the outer end and in effecting needed repairs. In 1885-6 some slight repairs were made to the outer face of the breakwater at a cost of \$109. In 1887-8 miscellaneous repairs were made at a cost of \$768.74. In February, 1892, two serious breaches were made in the work by heavy gales, and a quantity of gravel was driven through into the little boat harbour inside. If repairs had been made without delay the work could probably have been saved, but nothing was done, and in the next two or three years about 300 feet, *i.e.*, the whole work except the outer block, was destroyed, the remaining piece being 60 feet long, 22 feet wide, and from 18 to 20 feet high. Before this date six or seven schooners of 10 to 20 tons each, besides a number of smaller boats, were owned in the place, and considerable fishing was done. Since the destruction of the breakwater, and owing to the consequent lack of shelter, the schooners and boats were disposed of, and the fishing industry in the locality practically ceased.

In 1898-9 the sum of \$3,497.25 was expended in partially rebuilding the shoreward portion of the work on a new site, which was rendered necessary by the altered configuration of the beach; the remaining outer block was also thoroughly repaired. The new work, of which a length of 200 feet was built during the year, starts at the shore, at a point 350 feet eastward of the point where the former work began, and it was built in a north-westerly direction towards the outer block of the old work, with which it was connected. Besides the portion of the breakwater built during this year, a small boat channel, about 40 feet long and 8 feet deep, was excavated through the beach under lea of the breakwater, to give access to a salt water pond which forms a valuable shelter for fishing vessels during the heavy gales in the winter season.

In 1899-1900 the sum of \$2,599.96 was expended in completing the rebuilding of the breakwater begun last year, the portion of the work built being 81 feet long and 26 feet wide, with an average height of 12 feet. A piece of beach protection work, 240 feet long, 10 feet wide, and from 6 to 8 feet high was also built in a westerly direction from the shore end of the breakwater to prevent the seas from driving the gravel of the beach into the little open pond which shelters the boats of the fishing fleet. In 1900-1 the sum of \$149.92 was expended in replacing the ballast that was washed out by the heavy storm in October, 1900, out of the beach protection work adjoining the breakwater on its west side, and to prevent a recurrence of the damage it was covered with poles.

During the year 1901-2 the sum of \$2,542.18 was expended in extending the breakwater a distance of 90 feet. The new block is 26 feet wide and from 20 to 25 feet high, thoroughly well built of round log cribwork, close-sheathed on the outer end and seaward face, filled with ballast and provided with a break 5 feet high.

In 1902-3 the sum of \$1,004.47 was expended in extending the breakwater by a block 30 feet long, 25 feet wide and 25 feet high, strongly built of round log cribwork, filled with ballast and close-sheathed on the seaward face and outer end.

The total expenditure to June 30, 1903, is \$15,568.70, including a refund of \$1,297.15 to the provincial government in 1887-88.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.

## SANDY COVE.

Sandy Cove, Digby county, is a thrifty and beautifully situated fishing and farming settlement, of some 400 people, situated on Digby Neck, 19 miles south-west of Digby town.



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On February 12, 1903, a contract was entered into with Messrs. Hayden & Oliver of Digby, for the construction of a breakwater in the cove on the eastern, or Bay of Fundy side, of the neck, with the object of affording some much needed shelter to the fishing fleet. The amount of the contract is \$13,000. The breakwater when completed will be 211 feet long, 30 feet wide on top and 31 feet high at the outer end, where, at H.W.O.S.T., there will be about 27 feet of water. The work is designed to be of solidly built round log cribwork, the lower portion, up to 5 feet above L.W.O.S.T., being of creosoted timber to resist the attacks of the limnoria, which are here prevalent and destructive.

On June 30, 1903, the expenditure was \$2,510.51.

Spring tides rise 23 feet; neaps, 19 feet.

#### SHORT BEACH.

Short Beach is the name of a small fishing and farming settlement of about 100 people, situated on the coast of Yarmouth county, 8 miles north of the county town, 1½ miles north of Sandford and 3½ miles south of Port Maitland. The fishing fleet comprises a dozen small boats. On February 13, 1903, a contract (No. 4556; amount, \$8,095) was entered into with Messrs. Crosby, Landers & Moses, for the construction of a breakwater for the protection of the fishing fleet. The work, when completed, will be 400 feet long, 25 feet wide on top, and from 5 to 14 feet in height, solidly constructed of round-log cribwork, well fendered, ballasted and bolted, and close-sheathed on the seaward face and outer end.

On June 30, 1903, the value of the work done on the contract was \$1,773.10.

#### SOBER ISLAND.

Sober island, Halifax county, lies at the mouth of Sheet harbour, about 60 miles east of Halifax; it is about 3 miles in length, ¾ in average width, and is separated from the main land by a narrow channel. The population comprises about 50 families, engaged almost wholly in fishing. There is a lobster packing establishment on the island, and three small stores.

In 1902-3 the sum of \$797.18 was expended in the construction of a public wharf. The work consists of a rock bank approach, 36 feet long, and from 2 to 10 feet high, three blocks of cribwork 10 x 20 feet on top, and from 10 to 19 feet high, and two spans of 13 feet each. At low water ordinary spring tides there is a depth of 11 feet of water at the outer end of the work. Spring tides rise 6 feet, neaps 5 feet.

#### SOUTH GUT.

South Gut, Victoria county, is the local name of the southern arm of the head of St. Ann's harbour, which is a fine basin 7 miles in length, 2 miles wide, and having a great depth of water, situated at the head of St. Ann's bay, on the eastern coast of the Island of Cape Breton.

A wharf was constructed during 1890-1 on the southern side of South Gut, 198 feet in length and 20 feet wide, extending to 6 feet at low water, and consisting of a shore abutment 48 feet long and of four 20-foot blocks, built of native timber cribwork, with intervening spans 17½ feet in length.

In order to render the wharf accessible at all times of tides for the steamer 'Weymouth,' which calls here twice a week on her trips from the Sydneys to the north shore, and at the same time to facilitate the turning of teams on the wharf, on September 27, 1902, a contract was entered into for an addition to the wharf of 40 feet in length, extending to 8 feet in depth at low water, and consisting of a span 20 by 20 feet and of



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a cribwork block 20 by 40 feet, and the work was completed on June 30, 1903. The cost of the work was \$1,248.12.

Spring tides rise 6 feet.

The total expenditure on this work up to June 30, 1903, is \$3,506.06.

## SOUTH-WEST PORT MOUTON.

South-west Port Mouton, Queen's county, is a small settlement on the south-west side of Port Mouton bay, situate 5 miles south-west of the village of Port Mouton and 14 miles south-west of the town of Liverpool. In 1887 a breakwater was built at this place for the protection of fishing boats, which is 150 feet long, 24 feet wide on top and has a break 4 feet high along the whole eastern or outer side. The eastern side and the outer end, which is 11 feet high, are all close-faced cribwork. In 1902-3 badly needed repairs were made to the outer end, the break was rebuilt and the top 4 feet of the entire breakwater were renewed. Besides this an extension 42 feet in length, 22 feet wide and 13 feet high, was built. The total expenditure incurred in the said fiscal year was \$1,500. This amount covers the cost of 100 cubic yards of stone put in place, 21,948 cubic feet of cribwork built and fully ballasted to the underside of the floor-stringers, and the sheathing of 140 feet in length of the work with 7-inch logs hewn to 5-inch thicknesses and flatted and bolted. It is hoped that this breakwater as completed will thoroughly protect the cove from which the residents fish, and is in such a good condition as to require no further repairs for the next ten years.

## ST. ANN'S BEACH.

St. Ann's Beach, Victoria county, is on the eastern coast of the island of Cape Breton, and separates St. Ann's Harbour from the bay of the same name.

The entrance into St. Ann's Harbour is between the southern end of the beach and the mainland, and is very narrow, with great depth of water and a tidal current of four knots, but is obstructed by a dangerous bar outside, carrying but 18 feet at low water.

The beach extends from the northern to within 180 yards of the southern side, and forms the harbour. It is about a mile and a half in length, from 200 to 400 feet in width, and from 5 to 7 feet high, above high water level and is composed of large rolled stone and shingle; and besides forming a protection to the harbour, is used as a highway to the ferry which plies between its southern end and Englishtown, on the southern side of the entrance.

As within the last few years there has been a slight but gradual wearing away of the crest of the beach, at its southern end, caused by the action of the sea, and it was feared that this action, if permitted to continue, might eventually cut the channel through the beach, and endanger the stability of the harbour, the sum of \$1,800 was voted for expenditure during 1902-03 to be applied in the construction of the beach protection works.

Out of the amount voted, the sum of \$1,749.89 was expended in building a cribwork protection on the outer side of the southern end of the beach, 840 feet in length, 4 feet high and 6 feet wide on top with sides sloping 1 in 8, constructed of round timber, laid open-faced on a brush foundation, fully ballasted and close-sheathed on the seaward face and ends.

## SUMMERVILLE CENTRE.

Summerville Centre, Queen's county, is a small fishing village of about 150 people, situate 8 miles south-east of the town of Liverpool.

In 1879 the department built a breakwater about 200 feet long, 20 feet wide on top, and 16 feet high at the outer end. The whole work was built of square timber, close-faced cribwork. In the winter of 1898-99 this work was completely destroyed, and dur-



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ing the fiscal year 1900-01 the department reconstructed this breakwater. This time, however, instead of rebuilding with wood, it was deemed advisable, owing to its exposed position, to reconstruct the work in a more permanent manner on a site contiguous to the old one. The new breakwater was constructed entirely of large stones, cemented together and fastened with iron cramps. This work, which cost \$2,263.35, comprised an approach and a main structure. The approach is 58 feet long, 12 feet wide on top, and 6 feet high at its outer end. The main structure is 90 feet long, 24 feet wide on top, 33 feet wide at the bottom, and 16 feet high at its outer end. During the fiscal year 1902-03 this breakwater was lengthened 30 feet at a cost of \$999.69. The work done is 24 feet wide on top, 33 feet wide on the bottom and 18 feet high at the outer end. It is of the same character as that previously done and most excellently constructed. It contains about 540 cubic yards of heavy, granite masonry, well cemented and secured by iron dogs or cramps.

#### THREE FATHOM HARBOUR.

Three Fathom Harbour, Halifax county, is an irregular shaped inlet of the sea, about one mile in maximum length, from north to south, by one quarter to three quarters of a mile wide. It is situated about 15 miles east of Halifax Harbour. The harbour is much used and frequented by fishermen from the contiguous settlements of Seaforth and East and West Chezzetcook, containing in the aggregate a population of some 500 or 600 people. To prevent the sea from breaking through the narrow shingle beach that separates the harbour from the Atlantic, the department, in 1878, constructed cribwork along the crown of the beach. Its original length of 1,050 feet has been extended to 1,085 feet, its height is from 4 to 8 feet and its width 13 feet. It is built of round-log cribwork, well fendered and ballasted.

In the fiscal year 1901-2 the sum of \$1,189.91 was expended in taking down and rebuilding a length of 120 feet on the northern end of the work, which was in a state of dilapidation.

In 1902-3 the sum of \$1,785.57 was expended in repairs and improvements, the work done consisting of the thorough repair and rebuilding the top of 250 feet in length of the beach protection, and the construction of a new block on the northern end, 84 feet long, 12 feet wide and 11 feet high. The total expenditure by the department up to June 30, 1903, is \$9,090.66.

#### 'THE GATE.'

'The Gate' or 'the Sluice,' is the name given locally to a shallow opening or passage about half a mile wide and dry at low water ordinary spring tides, between the mainland of Comeau's Hill or Point and great Tusket Island, Yarmouth county. It is 12 miles in a direct line S.S.W. from Yarmouth. At and near high water the passage is much used by fishermen going between Tusket Island and Goose Bay on the east, and Chebogue Harbour and adjacent waters on the west. To enable the channel to be used during a longer period in each tide, the department in 1901-2 expended the sum of \$1,000 in deepening and widening it. The size of the channel formed by removing granite boulders with which the whole passage is covered, was 540 feet long and 30 feet wide.

In 1902-3 a further sum of \$1,000 was expended in widening the channel by an additional 20 feet, making it 50 feet in total width. At low water ordinary spring tides there is about one foot of water in the channel, and fishing boats of the district can use it at almost all stages of tide.

Spring tides rise 10 feet, neaps 8 feet.

The total expenditure by the department to June 30, 1903, is \$2,000.



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## TIDNISH.

Tidnish is in Cumberland county, near the mouth of the Tidnish river and about  $1\frac{1}{2}$  miles east of the boundary between New Brunswick and Nova Scotia.

The department in 1890-91 constructed here a wharf on the south side of the river. This wharf is 220 feet long, 20 feet wide on top and 12 feet high at the outer end, where an L or return 20 feet by 20 feet has been added; it is built of round-log, stone-filled cribwork with a batter of 1 in 12 on all faces. This work being much out of repair, the sum of \$1,500 was granted by parliament at its session of 1902, to not only repair but also extend this wharf a further distance of 25 feet, the extension to be 42 feet wide over all and to have a height at the outer end of about 14 feet. The repairs and extension provided for were commenced in the fall of 1902 and completed in the spring of 1903, at a total cost of \$1,066.13, the work being most substantially and cheaply constructed by day labour.

## TIVERTON.

Tiverton, Digby county, is a village of some 400 people mostly engaged in fishing and doing also some little farming, situated on the west side of Petit Passage, separating the mainland of Digby Neck from Long Island. It is about 30 miles south-west of Digby town, and 10 miles from Sandy Cove.

On February 12, 1903, a contract (No. 4,543) was entered into with Messrs. Hayden & Oliver, of Digby, for the construction of a breakwater to afford shelter to the fishing fleet. The work, when completed, will be 281 feet long, 30 feet wide on top, and at the outer end 33 feet high, where at high water ordinary spring tides there will be about 29 feet of water. The whole work will be substantially built of round-log cribwork, the lower portion up to 5 feet above low water ordinary spring tides is of creosoted timber, to resist the attacks of the limnoria.

Spring tides rise 21 feet.

Up to June 30, 1903, the amount paid was \$2,518.16.

## TRACADIE.

Tracadie harbour, Antigonish county, is on the southern shore of St. George's bay, 12 miles east from the entrance into Antigonish harbour, and 11 miles to the westward from the northern entrance to the Strait of Canso. It is separated from the bay by a series of islands and connecting beaches of sand and gravel, and its entrance was formerly to the westward of Delorey island, by a narrow and crooked channel with 2 feet at low water; but in 1863 the provincial government opened a passage, by dredging, on the eastern end of the harbour, through a beach which connected the mainland with Delorey island, and constructed a breakwater on its eastern side.

During 1874-5 the department repaired and extended the breakwater, and constructed a retaining wall of cribwork to the southward of it, to prevent erosion of the bank. Slight repairs were made from time to time up to 1884-5, when the breakwater was repaired and strengthened by close-piling, and the retaining wall, which had been destroyed, was reconstructed.

The breakwater, weakened by the ravages of the toredo, was badly damaged in 1889, and in the following year the whole of it, excepting a portion of the south face, 67 feet in length, was destroyed. During 1892-3 50 feet of the south face of the remaining portion was repaired and strengthened by close-piling.

The destruction, in 1890, of the greater portion of the breakwater involved the shifting of the channel at the entrance (originally carrying 6 feet at low water) 500 feet to the westward, and the wasting away of the beach, and consequent loss of land to the eastward by erosion.

To prevent further loss of land, and to improve and protect the entrance, during 1898-99-1900 the remaining portion of the old breakwater was repaired and strength-



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ened, and a side extension 100 feet in length, consisting of round-timber cribwork, with creosoted timber substructure, and close-sheathed on the seaward faces, was constructed.

During 1901-2-3 the retaining wall was reballasted, and a cribwork 'spur,' 40 feet long and 16 feet wide on top, close-sheathed on all outer faces, was built at its southern end to deflect the tidal currents off the bank into the channel.

The sum of \$381.64 was expended during the last fiscal year in raising, ballasting and covering of 52 feet of the shore end of the breakwater, in covering the retaining wall, 187 feet long and 10 feet wide with spruce poles, and in sheathing the outer face of the retaining wall for a distance of 30 feet from its junction with the 'spur.'

The reconstruction of the breakwater has had the effect of restoring the beach to the eastward nearly to its original condition, and to deepen the channel at the entrance.

The total expenditure to June 30, 1903, including \$1,228.69 refunded to provincial government, and dredging, is \$24,939.67.

#### TUSKET.

Tusket, Yarmouth county, is a prosperous village of some 400 people, at the head of navigation of the Tusket river, about 4 miles from the sea, situated 9 miles east of the town of Yarmouth. The principal industry of the place is lumbering, but there is also considerable farming done, and some fishing.

In 1902-3 the sum of \$580.08 was expended in constructing a small wharf alongside the public road for the purpose of landing sea manure, cordwood, fish, &c. The work consists of a rubble stone block, 35 feet long, 30 feet wide, and from 9 to 11 feet high, built on the outside with large well-shaped stone, laid up dry, with a batter on the three exterior faces of 1 in 12. The interior is filled with rubble stone of all sizes. The wharf is topped with gravel, fendered at intervals of 8 feet, and furnished with guard-timbers bolted to the top stones round three sides.

#### VICTORIA.

Victoria Harbour, King's county, is situated at the mouth of Church Vault Brook, on the south shore of the Bay of Fundy, 52 miles north-west of Digby Gut, and half way between Morden and Ogilve's Wharf, from each of which it is distant about four miles.

The breakwater, which also serves as a landing and loading pier, was begun in 1864 and finished in 1867, at the joint expense of the inhabitants and the provincial government. It is 243 feet long, 27½ feet wide at the outer end, 23 feet wide at its inner end, and 24 feet in height at its outer end.

In 1878 the work was repaired and raised 4 feet. Slight repairs were made in 1891 and in 1893.

In 1900-1 the sum of \$398.81 was expended in renewing 88 feet in length of the crib breastwork, forming the eastern side of the road approach. The new work is from 6 to 10 feet high, from 10 to 15 feet wide, strongly built of round log cribwork, well fendered and fully ballasted. A portion of the flooring of the shore end of the breakwater was also renewed.

In 1902-3 the sum of \$653.53 was expended in refilling with solid cribwork a breach in the shore end of the breakwater that had been made by heavy seas in the spring of 1901. The new patch is 30 feet long, about 18 feet wide and 14 feet high.

Spring tides rise 36 feet.

The total expenditure to June 30, 1903, is \$2,677.32, including a refund to the provincial government of \$450 in 1887-88.

This work was transferred to the control of the Department of Marine and Fisheries on June 12, 1888.



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## WASHABUCK CENTRE.

Washabuck, Victoria county, is a district on the south side of the eastern end of St. Patrick's channel, an arm of the Bras d'Or lakes, and extends about 6 miles along the shore. Washabuck Centre is situated near the centre of the district.

In order to facilitate the shipment of agricultural produce and cattle from the district, the sum of \$5,500 was voted for expenditure during 1902-3 on a wharf at Washabuck Centre, and on April 6, 1903 a contract in the sum of \$5,860 was entered into for its construction.

The work under contract consists of a block and span wharf, 218 feet in length and 20 feet wide, with an L at the outer end, 20 by 20 feet; and of a road to connect the wharf with the public road, 102 feet long and 20 feet wide, fenced on each side. The blocks are to be of round timber, laid open-faced with creosoted timber substructures, and the two outer blocks protected by close-sheathing on their outer faces.

The depth of the water at the outer end will be 12 feet at low lake level, which rises about 12 inches.

At the end of the fiscal year preparations were being made to commence the work. The sum of \$182.92 was expended in calling for tenders, &c.

## WEDGE POINT.

Wedge Point, Yarmouth county, is the southern extremity of the peninsula called 'Tusket Wedge,' 3 miles long, north and south, by half a mile to a mile wide, east and west, situated some 10 miles south-east from Yarmouth, the county town. The population of the peninsula comprises some 500 people, the majority being engaged in, and more or less dependent upon, the fisheries. On the east side of the peninsula there was no shelter or protection whatever for the fishermen, of whom there are a considerable number, and they were obliged to keep their boats in Goose bay, on the western side.

In 1902-3 the sum of \$1,000 was expended in commencing the construction of a breakwater. The work so far completed is 119 feet long, 19 feet wide and from 5 to 12 feet high; it is substantially built of round-log cribwork, well fendered and ballasted and close-sheathed on the seaward side.

## WEST BACCARO.

West Baccaro, Shelburne county, is about 3 miles west of the village of Port La Tour, and has a population of about 400, mostly engaged in the fishing industry. It is one of the roughest spots on the south-east coast of Nova Scotia, and in the past the fishermen have pursued a very hazardous calling, and have been handicapped by the lack of a safe mooring harbour for their boats, often having to stand on the shore and watch their boats and other property being destroyed by the storm. To lessen the dangers of their calling and obviate further losses, the conversion of a pond, in part available at low tide, into a boat harbour was commenced in May, 1903, by constructing a protection wall around it on its exposed sides and excavating a channel on the inner side, to be protected so as to prevent its filling in again. Total expenditure incurred in 1902-3 in carrying on this work, \$1999.99. The total estimated cost of this projected work is \$5,500, and it is believed an additional outlay of \$3,500 will suffice to complete it in 1903-4.

## WEST BAY (SOUTH).

West Bay (south), Richmond county, is situated on the south side of West Bay, the south-western arm of the Great Bras d'Or lake.

'The Points,' so called from the number of headlands projecting into the south side of West bay, is a scattered settlement, extending along the shore for a distance of



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4 miles, and the centre of the settlement is about 12 miles eastwardly from West Bay port,, at the head of West bay, and 15 miles northerly from St. Peter's Canal.

The sum of \$2,000 was voted for expenditure during 1902-3 on a wharf on the south side of West Bay, and the site selected for it is at 'The Points,' inside of Pringle island.

A plan and specification for a pile-wharf, 250 feet in length and 20 feet wide, extending to 12 feet of water at low water, were submitted in January, 1903, and tenders for its construction were called for on February 13 following, but up to the end of the fiscal year 1902-3 the contract had not been signed.

The expenditure incurred in calling for tenders, printing, &c., was \$134.26.

#### WESTERN HEAD.

Western Head, Queen's county, is a fishing settlement on the south side of Liverpool bay, about 4 miles south of Liverpool town. In 1887 the department began the construction of a stone breakwater here, and during the following year completed the same. The breakwater was constructed entirely of large stone, quarried for the purpose; the portion of the work, from low water mark upwards being built of selected stone firmly bolted together with iron dogs. The whole work originally constructed was 190 feet long and 40 feet wide on top. Soon after the breakwater was completed, 100 feet at the outer end of the work was destroyed, and in the following year, 1889-90, the sum of \$5,000 was spent in rebuilding it. The projecting points of the reef were cut away, and a bed prepared for a foundation course, which was seated on bed rock, and the interstices were filled in with Portland cement concrete. Each succeeding course was laid in a similar manner. The top of the breakwater for 5 feet above high water and the surface were finished smooth. The total length of the work built during this year was 106 feet, so that on June 30, 1890, the breakwater was 196 feet in length. During the year 1898-9 the sum of \$965 was expended in repairing this work. The older portion of the breakwater, 90 feet in length, 29 feet wide and with an average height of 8 feet, was practically rebuilt, and also material repairs were made to the newer work built in 1889-90. During the fiscal year 1902-3 the sum of \$2,958.55 was applied in adding two blocks, each 25 feet long, 30 feet wide and 10 feet high, to the breakwater, and building about two-thirds of a third block of the same dimensions, which it was expected would be completed about October 1, 1903.

#### WHITE HAVEN.

White Haven, Guysboro' county, one of the finest harbours in Nova Scotia, is on the south or Atlantic coast, 14 miles to the westward of Cape Canso.

In 1854 the residents, with some aid from the provincial government, undertook the construction of a canal for boats through a low and narrow isthmus between Marshall cove, 3 miles within the entrance, and Witch cove, at the eastern extremity of Tor bay. On the completion of improvements made in 1876, it was 620 feet in length and from 10 to 12 feet in width; the bottom was about 1 foot above extreme low water, or 4 feet 6 inches below the level of extreme high water. Prior to 1884 the walls had become dilapidated, the southern entrance was blocked with sand, and the channel inside filled with sediment and washing from the slopes.

In 1894-95 repairs and improvements were made by the department, with the object of obtaining ultimately a uniform depth at extreme low water of 1 foot, and a width between retaining walls of 12 feet. The repairs and improvements effected included the removal of 160 feet of old retaining wall on each side at the south end, and the construction of walls 10 feet wide on top, of which 20 feet at the outer end on each side are of cribwork, and the remaining walls 140 feet of brush and stonework; temporary repairs to the retaining walls on both sides from 160 to 270 feet from the south end, and on the east side from 328 feet to 480 feet from the south end; the con-



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struction of new walls on either side from 480 to 500 feet from the south end as foundations for bridge abutments, built by the municipality; the reconstruction of 100 feet of wall on the west side (500 feet to 600 feet from the south end); the construction of 141 feet of temporary wall on either side (600 to 741 feet from the south end), and deepening from end to end to within 3 to 6 inches of extreme low water.

In 1900-1 and 1901-2 the sum of \$2,686.53 was expended in continuing the repairs and improvements undertaken in 1894-5. The work performed comprised the construction of 137 feet of brush and stone retaining wall on each side, 160 to 297 feet from the south end; the removal of the old retaining wall on the west side 328 to 740 feet from the south end; and on the east side 588 to 740 feet from the south end; the construction of a new retaining wall 583 feet in length on each side (167 to 750 feet from the south end) and deepening between the retaining walls to about 1 foot at low water.

During the fiscal year 1902-3 the sum of \$799.25 was expended in constructing 80 feet of brush and stonework on each side (750 to 830 feet from the south end) and in completing the work undertaken, with the exception of the cribwork retaining wall 20 feet in length, on each side at the north end.

The total expenditure to June 30, 1903, including a refund of \$876.42 to the provincial government, is \$5,817.23.

## WHITEWATER.

Whitewater, King's county, is a small farming and lumbering settlement of 200 or 300 people, situated on the west coast of Minas Basin, about three-quarters of a mile south of Cape Blomidon, and 10 miles north-east of the village of Canning. In 1897-98 the department built a public wharf at a cost of \$3,999.08 by day's labour. It is 285 feet long, 20 feet wide, with an ell at the outer end 35 feet long, where at high water ordinary spring tides there is a depth of 17 feet of water. The wharf is constructed of block and span work, the blocks being solid cribwork, 19 feet long in the stem of the wharf, the spans being 14 feet in clear opening. The work is in good condition. Spring tides rise 40 feet, neaps 34 feet.

In the fiscal year 1901-2 the sum of \$249.95 was expended in building a block of cribwork 40 feet long, 10 feet wide and 12 feet high, on the northern side of the shore end of the work to replace an ancient and dilapidated block that retained the bank forming the approach.

In 1902-3 the sum of \$881.98 was expended in filling the two outer spans of the block and span wharf with solid cribwork to full height and half width: *i.e.*, 11 feet by 18 to 19 feet high, and constructing a small block about 10 feet square and 10 feet high at the shore end, to act as a retaining wall for the approach. Total expenditure to June 30, 1903, \$5,131.01.

## WHYCOCOMAGH.

Whycocomagh, Inverness county, is a village on the northern side of a bay of the same name at the head of St Patrick's channel, an arm of the Bras d'Or lake.

A private wharf at this place was purchased, together with a warehouse and a right of way to the public road in 1897-98, and repaired and extended during the years 1898-1900. It is 228 feet in length, including 144 feet of stonework 21 feet wide, and 84 feet of pilework (25 feet in width over 59 feet of its length and 60 feet in width over the outer 25 feet) built over the remains of an old block and span structure. The depth, at the outer end, is  $12\frac{1}{2}$  feet at low, or  $13\frac{1}{2}$  feet at high lake level.

During the fiscal year 1902-3 the sum of \$450 was expended in repairing the sides and ends of the outer 50 feet of the approach, and in blocking up and repairing the floor of the warehouse.



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## YARMOUTH BAR.

Yarmouth, the county town of Yarmouth county, is situated at the south-western extremity of Nova Scotia. It is a thriving and prosperous town of nearly 7,000 inhabitants, and, next to Halifax, the largest and most important in Nova Scotia. It is also the terminus of the Dominion Atlantic Railway, whose fine Clyde-built steamers make regular trips throughout the year to Boston. There are several important manufactories in the place, but the leading business is shipping, of which a larger tonnage is owned here than in almost any locality in Canada.

At low water Yarmouth harbour—in which spring tides rise 16, neaps 13 feet—consists largely of mud flats covered with eel grass. The harbour is formed by a succession of shingle or gravel beaches (called Stanwood beaches), aggregating about 1 mile in length, which connect the northern end of Cape Fourchu island, also about a mile long, with the southern end of Stony Point, on the mainland, and separate the harbour from the Bay of Fundy.

In 1867 it was found that part of the beach between Cape Fourchu and Stony Point was gradually wearing down, and unless this action was arrested the sea would eventually sweep away the beach and destroy the harbour. The Government of Nova Scotia began the work of protecting the beach in 1867, by constructing 200 feet of cribwork at Stony Point. Between 1873 and 1875 the Public Works Department constructed the remaining 2,800 feet of protection work required to reach Cape Fourchu, and added buttresses or groynes to stop the movement of the gravel.

Between 1875 and 1888 the protection works, though substantially built of stone-filled cribwork and close piles on their seaward faces, had to be repaired and strengthened, the expense amounting to over \$25,000.

Between 1888 and 1896 no further works of repair were undertaken on the beach protection, and it became dilapidated and decayed. Breaches were made through it by the sea in various places. During the year 1896-7 the sum of \$2,983.62 was expended in carrying on the most urgent works of repair, and in 1897-8 a further sum of \$3,234.51 was expended in continuing and completing these repairs. This last sum was applied in rebuilding a length of 50 feet at the eastern end of the protection work, and in constructing a groyne, projecting at right angles from the same end, for a distance of 175 feet. The groyne is 25 feet wide and 11 feet high, substantially built of round-log stone-filled crib work. Its object was to protect the beach at the north-eastern end of the main cribwork protection, by accumulating the gravel and breaking up the waves before they expended their force on the beach. It has admirably fulfilled its purpose, as gravel has accumulated at the junction of the groyne with the main work to a depth of over 14 feet.

In 1898-9 the sum of \$300 was expended in repairing a small but serious breach, 25 feet long, in the bottom of the outer face of the beach protection work, and in covering with 3-inch hemlock plank a length of 430 feet of the top of the work, in order to prevent the ballast from being washed out by the waves.

In 1899-1900 the sum of \$970.27 was expended in repairing two or three small but dangerous breaches in the seaward face of the work, and in covering the top for a length of about 670 feet with 3-inch plank to prevent the sea from washing out ballast.

In 1900-1 the sum of \$3,389.70 was expended in extensions and repairs, the individual expenditures of the work done being as follows:—

(a) \$142.43 was expended in repairing and filling with ballast a length of 60 feet of the older portion of the work.

(b) \$2,798.50 in extending the work 514 feet westerly; this new length is 8 feet wide, from 5 to 8 feet high, substantially built of round-log cribwork, sheathed on the seaward side, and covered on top with round spars, well spiked on.

(c) \$448.77 in rebuilding a length of 50 feet of the older portion of the work near its eastern end, which was severely damaged by a heavy sea on November 9-10, 1900.



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In 1902-3 the sum of \$120.94 was expended in a few petty and miscellaneous repairs to the beach protection work, the work done comprising the replacing of a few pieces of close-sheathing, washed off by winter seas, the renewal of some flooring, and the re-spiking of loose portions.

Spring tides rise about 15 feet, neaps 12 feet.

## PRINCE EDWARD ISLAND.

## AITKEN'S SHORE PIER.

Aitken's Shore pier, King's county, is on the south side of the Montague river, opposite Georgetown. The pier was in former years quite an important place of shipment, and also used as landing for the ferry steamer plying between Georgetown and Lower Montague, since, however, the construction (about 20 years ago) of the new ferry landing half a mile east and lower down the river, and a private wharf a short distance west of it, the pier was not kept in repair and latterly had become a complete wreck, and useless for shipments. The great need of proper shipping and landing facilities in the locality having been represented to the Dominion government by the residents of the surrounding districts, the old pier was taken over from the local government and parliament made an appropriation of \$3,200 at the session of 1902 for the works of reconstruction required to place the pier in serviceable condition. Materials were got out during the winter of 1902-3 and construction began early in May. By June 30, 1903, the end of the fiscal year, a length of 167 feet of the shore end of the pier, 22½ feet wide, had been rebuilt the full height, and an adjoining length of 80 feet, also 22½ feet wide, to within one foot of the top. On the outer 113 feet, where the width is 30 feet at the bottom of the work to be rebuilt, the inner 40 feet in length was built up to within 4 feet of the top. The pier when finished will be in all 360 feet long, extending out to a depth of 7½ feet at low water or of 12½ feet at high water spring tides that here rise 5 feet. At the bottom the structure is formed of poles close laid lengthwise and crosswise, which are ballasted at intervals through pockets formed for the purpose. The top portion, from 3 to 4 feet in height, consists of walls of squared timber secured by longitudinals and cross-ties, the space thus enclosed being filled with ballast, on top of which a roadway is formed of broken stone and gravel; the sides and end of the pier are fender-piled at 5 feet centres. The expenditure incurred up to the end of fiscal year amounted to \$2,163.99, which covers the cost of much material ready for use in the work.

## BAY FORTUNE.

Bay Fortune harbour, King's county, is situated on the south side of Rollo bay, on the east coast of the island, and about 5 miles south-west of Souris, the eastern terminus of the Prince Edward Island railway.

To improve the channel leading to the wharfs, situated on either side of the Bay Fortune river, the provincial government, some years ago, built a breakwater on the eastern side so as to contract the channel and increase the scour, thus to deepen the water over the bar obstructing the entrance. During 1892-93-94 the department extended the breakwater, placed the inner part in good repair and connected the work with the wharf at the point of the bar by a beach protection composed of brush, stone and timber to prevent the formation of a false channel. The breakwater has now in all a length of 850 feet and a width of from 12 to 20 feet; much benefit is said to have resulted from its extension, the depth of water over the bar being now two feet better than formerly.



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During the summer of 1902 and the following spring, the sum of \$999.84 was expended in general repairs undertaken to make good the damage resulting from settlement, the work done consisted in the levelling of the channel face of the breakwater by putting on an extra timber secured by cross-ties, &c., driving piles along this face at 10 feet centres, and filling in fully the work with brush and stone.

## BRAE.

Brae Harbour, Prince county, is situated at the mouth of the Brae river, on the northern side of Egmont bay, 8 miles east of West Point, and about 6 miles south of 'Coleman Station' on the line of the Prince Edward Island railway, which station is 36 miles from Summerside, the shire town of the county. At the mouth of the river, an area carrying a depth of about 6 feet of water, is well sheltered by Brae island, and would prove a good fishing station and harbour of refuge for small vessels, as well as a most convenient place for shipments, were it not that the approach to it is obstructed by a sand bar, almost dry at low water, that extends completely across the entrance which is parallel with the shore, and at a distance of about a quarter of a mile. In 1890 the inhabitants of the surrounding district, with a view of improving the approach to the harbour, began the construction of a breakwater for the purpose of contracting the entrance and thus causing an increased scour that would deepen the water. They built a work 350 feet long composed of brush, poles, and some stone ballast, finished with clay filling on top, to this the department, in 1892, added a length of 200 feet of similar work, and in 1895 repaired or more properly rebuilt the original work constructed by the inhabitants that was of weak and poor construction. In 1898-99 a further addition of 100 feet was made to the breakwater, which is now in all about 650 feet in length. While the work affords a good and safe shelter for boats and landing shipping accommodation for small vessels, it has but little improved the entrance over the outer bar, to do which it needs to be further extended.

During the fiscal year 1902-03 the sum of \$388.25 has been expended in repairing and strengthening portions of the existing work that had been damaged by high storm tides, the action of the ice and settlement. The work done comprises repairs to the roadway with gravel and broken stone, the close fender-piling of 60 feet in length inward of the outer 100 feet, on the south or seaward side; fender-piling parts of the inner work on both sides, and putting in new cross ties, where necessary and possible, so as to keep the breakwater in good condition by preventing the further spreading of the top timbers.

## CAMPBELL'S COVE.

Campbell's Cove, King's county, is on the north side of the island, about 9 miles from East Point and 14 miles north-east from Souris, the eastern terminus of the Prince Edward Island railway. The place was, in 1872, selected by the provincial government for the construction of a small breakwater, 300 feet long and 30 feet wide, on the reef that extends from the west side of the cove, its inner end being 70 feet beyond high water mark. Much benefit being derived from the work, both by the fishing and farming industries of the district, the Dominion government took over this breakwater when Prince Edward Island entered Confederation. In 1882-3 necessary repairs were made and the work was extended 250 feet seaward and a gap of 70 feet between its inner end and the shore filled in, making the work in all 620 feet in length. This breakwater sheltered a small area carrying a depth of about 4 feet of water at low tides or 8 feet at high water springs, which rise here about 4 feet. The old breakwater continued in good condition up to 1899, when some slight repairs were required; after that date, however, owing principally to the ravages of the teredo, each storm caused more or less damage to the cribwork, and notwithstanding the extensive repairs made in 1895 the work continued to suffer each fall and winter. In 1899 a



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length of 80 feet of the original work was completely carried away, and an adjoining length of 50 feet so badly injured as to require reconstruction. This latter damage was made good in 1900-01, and the outer part of the work, destroyed in 1896, was rebuilt during 1901-2. During the fiscal year 1902-3 the sum of \$799.24 was expended in further strengthening the work by putting in new ballast where settlement had occurred, close fender piling several portions of the seaward face and fender piling this face and the inner side at 10 feet centres; the whole work being as far as possible placed in good condition.

## CANOE COVE.

Canoe Cove, Queen's county, is situated on the south coast of Prince Edward Island, and distant by water about 18 miles from Charlottetown, and about 10 miles from Crapaud. There is fairly good shelter at the place for boats from winds from south-east to west, some protection being afforded by a reef on the east side of the cove; it is, however, exposed from the south to the south-west. The construction of a breakwater was commenced about the middle of April, 1901, the work being done by day labour under a foreman. At the close of the fiscal year 1901-2 a length of 100 feet of work had been completed and the bottom portion of an additional length of 100 feet was about ready for placing. In 1902-3 this block was placed in position at the outer end of the 100 feet block then completed, and the superstructure was carried up to within 2 feet of the height required, the whole at an expense of \$3,172.39.

The work which is being built is isolated, its inner end being about 500 feet from the point on the eastern side of the cove, and it runs nearly due west out to a depth of from 4 to 5 feet of water at ordinary low water, or of from 12 to 13 feet at high water spring tides. At the bottom its width is about 32 feet, and up to about 1 foot above low water both the inner and outer sides have a batter of 1 in 12; on the inner side the same batter is continued to the top, but the outer or seaward side has a slope of 1 in 1, and this sloping face is sheathed with 4-inch hardwood plank; the top of the breakwater, which stands 55 feet above high water ordinary spring tides, and has a width of 19 feet, is to be covered with 4-inch planking.

## CASCUMPEC HARBOUR AND BAY.

Cascumpec harbour and bay, Prince county, are on the northern coast of the island, the entrance being about 18 miles south of Cape North, and 20 miles south-westerly from the entrance of Richmond bay. The harbour and bay are connected by what is known as 'Cascumpec Narrows,' a shallow stretch of water from  $\frac{1}{2}$  to 1 mile in width, lying between the sand dunes and sand bars that extend nearly parallel with the shore of the island, between the entrance of the two harbours or bays. Cascumpec harbour is of considerable extent, with a good depth of water and perfectly sheltered from all winds. It is much used as a harbour of refuge by coasters and fishermen. At its head is situated the town of Alberton, the second in importance in the county, and a station of the Prince Edward Island railway, which has a branch to a deep-water wharf, with sidings, freight house, &c., on the harbour, from where extensive traffic is carried on during seasons of shipment. Like all the harbours on the northern coast of the island, however, its approach is obstructed by an outlying shifting sand bar, that lies about a mile from the entrance between the beaches, and on which is usually found at best about 10 feet at low water; this depth is sometimes reduced owing, it is said, to breaches that have occurred in the sand beaches; these breaches are openings known as 'New harbour' and 'Goose harbour,' situated about 2 and 3 miles east of the entrance proper. Latterly a further break occurred in the beach about a mile east of the entrance; injury to the harbour being feared, it was decided to close in this break. During the winter and spring of 1903 a structure 450 feet in length was built, of brush work, 30 feet wide at bottom, with a superstructure of cribwork fully ballasted, fender



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piled, &c., at a cost of \$1,904.76. The opening was completely closed, but another break of 90 feet in width has occurred in the beach at the northern end of the structure. It appears to be doubtful that permanent closing of the breach is possible, unless very extensive works of protection be built.

## CHAPEL PIER.

Chapel pier, King's county, is on the south side of Grand river, about 3 miles from its entrance into Boughton bay, and 9 miles from Cardigan station, on the line of the Prince Edward Island Railway. The pier, constructed by the local government previous to Confederation, was assumed by the Dominion government in 1884; it consisted at the time of a shore abutment or approach 205 feet long, with a block and span at the outer end forming a total length of 249 feet, 22 feet wide, which carried at its outer end a depth of 7 feet at low water or 12 feet at high water spring tides. During 1889-90 a length of 44 feet was added by the reconstruction of a former block and span, extending the work into a depth of 9 feet at low water. Owing to the destructive action of the teredo, that had destroyed nearly all of the lower portions of the fender piling, and the ice that formed each winter in the openings between the blocks having the effect of forcing them outward, it was deemed advisable to fill in the openings solidly, which was done during the fiscal year 1902-3, with close laid poles, &c. The outer block was close pile fendered, the top of the shore abutment was rebuilt and fendered at 10 feet centres; the roadway was rebuilt with broken stone, and general repairs made where required, at a total cost of \$1,099.25.

## CRANBERRY HEAD.

Cranberry wharf, Queen's county, is situated on the south side of the East or Hillsborough river, about 14 miles from Charlottetown. Originally built by the provincial government many years before Confederation, the wharf at this place came under the control of the Dominion government in 1898, when the sum of \$2,075.35 was paid to the local government as a reimbursement for the expenditures made to repair the structure after 1873. When its control was assumed the wharf was in very bad condition, owing to age, and had latterly become unserviceable. The sides of the shore abutment being decayed, had fallen down, and the span connecting the outer block had been carried away; the top of the outer block or pier head being also decayed was much damaged by running ice. Repairs and reconstruction of the whole structure were effected during the fiscal year 1902-3 at a cost of \$1,126.77. The work done consisted in rebuilding the top portion of the pier for an average height of 6 feet, close-piling around the outer block, replacing the span beams and covering, planking over the outer block, renewing the roadway on the shore abutment with stone and gravel, and fender piling its faces at 10-foot centres.

## COVE HEAD BAY.

Cove Head bay, Queen's county, is situated on the north side of the island, about midway between Tracadie and Rustico harbours, or at a distance respectively of 5 and 6 miles. Within its entrance, which at low water is about 250 feet wide, the bay is about 4 miles in length and from  $\frac{1}{2}$  a mile to a mile in width, it receives the waters of the Black river, and of Mill, Auld's and McCallum's creeks. It is navigable over most of its extent for small vessels, the depth on the outer bar, however, is only  $3\frac{1}{2}$  feet at low water, or  $7\frac{1}{2}$  feet at high water spring tides.

The harbour proper commences immediately inward of the entrance and extends westward between the sand beach and what was an extensive sand flat, dry at about half-tide. Formerly the main channel into the bay was on the western side of the sand flat; it had a width of from 300 to 400 feet, with a depth of 5 feet and over at low



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tide; the small channel that existed on the east side of the flat was shoal and narrow. During late years two other channels have opened up through the sand flat, resulting in the main channel becoming nearly closed. In order to improve this condition, a contract was entered into on March 12, 1903, for the construction of a shear dam 1,575 feet long, extending in a north-westerly direction from the south-eastern side of the bay and completely closing two of the channels. The shear dam consists of cribwork, brush, stone and piles. Work was commenced early in May, and by June 30 the bottom portion, up to about the height of ordinary high tide, had been built over a length of 980 feet, and the greater part of the materials required had been delivered. The expenditure was \$1,289.40.

## GEORGETOWN.

Georgetown, the shire town of King's county, is the terminus of the Georgetown branch of the Prince Edward Island Railway. The pier at this place is one of the Prince Edward Island piers, control of which was assumed by the Dominion government in 1883-4, before the damage it received during the storm and tidal wave of October 11, 1900, and the succeeding storms of that fall and winter; had in all a length of 640 feet, with a width of from 30 to 36 feet; along the sides of its outer 300 feet a depth of 12 feet at low water, or of 17 feet at high water spring tides was found. The shore abutment, or approach, is 340 feet long, constructed of close-faced timber work, filled in with brush, stone and clay on top, forming the roadway, while the outer part consists of six blocks spanned by stringers covered with planks. During the storm in the fall of 1900 the four outer blocks and connecting spans were carried away, while the two inner blocks and west side of the shore abutment were greatly damaged, the reconstruction of the two inner blocks and repair of the shore abutment were effected during the fiscal year 1902-3, at a cost of \$4,405.26.

## GRAHAM'S POND.

Graham's Pond, King's county, is situated on the east coast of the island, about 5 miles from the entrance to Cardigan bay, and about the same distance north of Murray Harbour.

The pond has a length of about half a mile on a width of from 600 to 800 feet, carrying in the body of the pond and a short distance from the entrance, a depth of 3 to 8 feet at ordinary pond level, which is usually from 1½ to 2 feet higher than ordinary low water, or 3 or 3½ feet below high water spring tides, that here rise about 5 feet.

During 1900 the Department of Marine and Fisheries cut a new channel into the pond in order to make it possible for boats to enter at all times of the tide, but the new cut filled in again nearly to its original state during the following fall and spring storms. Under instructions of the department, in the fall of 1901, the cut made by the Marine and Fisheries department was cleared out and a protection of brush and stone was built, and proved most effective, keeping the channel in the desired course, as well as giving some shelter for boats.

At the urgent desire of the residents of the district a further expenditure of \$500 was made at the place during the fiscal year 1902-3. The brush protection works on the south side of the new channel that had a length of 90 feet, was extended 100 feet outward, and a length of 150 feet of protection work built on the north side.

## HICKEY'S WHARF.

Hickey's Wharf, Queen's county, is situated on the southern side of the East or Hillsborough river, about 10 miles from Charlottetown; it was constructed by the local government many years before Confederation, and is one of the Prince Edward Island piers, the control of which was assumed by the Dominion government in 1884; the work



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is 428 feet long, the inner end, for a length of 248 feet, is 22 feet wide, and the remaining portion, 180 feet long, is 28 feet wide and forms the chief loading place for vessels, where some dredging was done in 1881-82 giving a depth of about 10 feet at low water, or of 19 feet at high water spring tides. When the wharf was taken over by the Dominion government it was in a most dilapidated condition and has, at different times since, been repaired to keep it in passable condition for traffic. During the fiscal year 1902-03 the sum of \$253.12 was expended in putting in 9 new span beams, repairing the planking, putting in new mooring posts, guard timbers, fender piling, &c.

#### MIMINIGASH HARBOUR.

Miminigash Harbour, Prince county, is situated on the north-west coast of the island, about 15 miles from North Cape and 18 miles from West Point. Before its improvement by the department, it was one of the numerous ponds along the coast that empty into the Gulf of St. Lawrence, by numerous channels through sandy beaches; these channels constantly change their positions, and during severe storms are, at times, completely blocked up. The entrance to Miminigash Pond, however, being sheltered to a great extent by 'Miminigash Reef,' a ledge of rock nearly a mile long, lying parallel to the shore and about half a mile distant, has the advantage over the other ponds on the coast, and is the one generally used by the fishermen during stormy weather for shelter. After an examination of different sites proposed, Miminigash was selected by the department for the formation of a harbour; with this object in view, work was commenced in 1878, and now consists of breakwaters or piers on either side of the entrance, placed 56 feet apart, confining the channel and keeping it in permanent position. The breakwater on the north side is 550 feet long, and that on the south side 350 feet, inward of both there are beach protection works so as to guard against new channels forming at the back of the breakwaters. These protection works are of cribwork, solidly filled with brush, poles and stone. The one on the south side is 270 feet long, and on the north side 350 feet. During the fiscal year 1902-03 the sum of \$501.76 has been expended in strengthening the different works at this place, repairs were made to the planking of the north breakwater, and the outer face of the south breakwater was close-piled, the ballast that had been washed out was replaced, and the beach protection work repaired where found necessary.

A portion of the channel was also deepened on a length of 95 feet, 10 feet wide and 8 feet deep, at a cost of \$181.26.

#### MORRISON'S BEACH.

Morrison's Beach, King's county, is on the south side of the entrance of Grand river into Boughton bay, its north end being opposite Annandale pier, where the width of the river is about 1,200 feet. The beach, which extends in a northerly direction, has a length of about 4,230 feet and a width of from 200 to 600 feet at ordinary high water, or of from 600 to 2,000 feet at low water spring tides. At one time it is said protection works of brush, stone and poles extended the full length of the beach, but were destroyed some 25 years ago by a storm that then occurred, a part of the work was reconstructed some 15 years ago, but this as well was shortly destroyed or rendered useless for the purpose intended, viz.: to form a roadway available for traffic at all times of the tide to 'Morrison's Beach,' where there was a shipping place for produce, the high parts of the beach being usually covered with drift materials, while the lower parts, at and near high water, were so covered with water as to be impassable. During 1901-02 brush hurdles were constructed along the centre of the beach on a distance of 3,500 feet, for the purpose of arresting and accumulating the drifting sand, and prevent the high storm tides passing over it, this result to a great extent was obtained. During the fiscal year 1902-03 all of the damaged parts of the work have been rebuilt and other parts strengthened at a cost of \$399.60.



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## NEW LONDON HARBOUR.

New London Harbour, Queen's county, is on the northern coast of the island, about 10 miles east from the entrance into Richmond bay. The entrance of the harbour has a width of about 1,200 feet, it is about 3 miles long and nearly as wide; it receives the waters of the Hope, the South-west, the Stanley and the French rivers, all of which are navigable for short distances and have wharf accommodation from which an export is made of large quantities of farm produce; the districts surrounding the harbour are well cultivated and very productive. The harbour is largely used as a fishing station and harbour of refuge, for which it is most conveniently situated, the fishing grounds in the vicinity are considered the best on the Gulf of St. Lawrence. For the improvement of the entrance, which is obstructed by a shifting sand bar, works were begun by the department in 1878, these now consist of breakwaters or beach protection works on each side; that on the eastern side has a length of 1,120 feet, while the western one is 460 feet long; the object of their construction being to extend and preserve the sand beaches, and to so confine the current as to cause increased scour across the sand bar. The result obtained has been most satisfactory, the depth of water in the harbour is 6 feet at low water, and 12 feet over the bar, making this one of the best on the north coast of the island, since construction the western work has received no damage, the eastern one, however, being exposed to a very strong tide, the action of running ice, and at times, to a very heavy sea, requires, about yearly, some expenditure for its maintenance. During the fiscal year 1902-03 the sum of \$745.93 was expended in rebuilding a length of 50 feet, and in repairs to a further length of 200 feet, additional bolts were put in the sheathing of the outer block.

## POWNAL.

Pownal Pier, Queen's county, is situated on the north-eastern shore of Hillsborough bay, about 9 miles east from Charlottetown, it was built by the local government many years before Confederation, and is one of the Prince Edward Island piers, the control of which was assumed in 1884 by the Dominion government. The pier has a total length of 753 feet and consists of a shore abutment or approach 209 feet in length, 16 feet wide, and of 14 blocks with intervening spans. The inner blocks are from 14 to 16 feet wide, while the outer ones, forming the pier-head, have a width of 40 feet; originally there was little or no water at the end of this pier at low water, but in 1881-82, in order to enable small vessels to reach it at all times of the tide, and larger vessels at high water, the department had a channel dredged on a length of 1,275 feet and 50 feet wide, to a depth of 6 feet at low water, from the end of the wharf to deep water; a basin 250 feet long and 90 feet in width was also dredged on the eastern side of the outer end of the pier. Being a very old structure and much out of repair when its control was assumed by the Dominion government, it has since, at different times, required some repairs in order to keep it in good condition for traffic; all the top portion was decayed owing to age, the fender piling and other timbers, below and near low water, were injured by the teredo. The structure was greatly damaged by the tidal wave and storm in the fall of 1900, temporary repairs were made in the summer of 1901 so as to render the pier available for shipment, and during the winter and spring of 1902, materials costing \$673.58 were got for the repairs and reconstruction required.

During the fiscal year 1902-03 the sum of \$954.64 was expended for repairs, the work had not been completed at the end of the fiscal year.

## RED POINT.

Red Point pier, Queen's county, is situated on the eastern side of the East or Hillsborough river, about 7 miles north-easterly from Charlottetown. This pier was constructed many years ago by the local government; it has a total length of 650 feet,



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averaging 21 feet in width, it is composed of a shore abutment 310 feet long and 5 separate 'blocks' and intervening 'spans'; the blocks are from 29 to 75 feet in length, and the spans from 21 to 25 feet, the whole of the work is built of close-faced timber, filled in with brush and stones, clay filling forms the roadway on the blocks, excepting the outer one which, with the spans are floor stringered and covered with 3-inch plank-ing.

Originally, the outer end of the pier was dry at low water. In 1890 the department had a channel dredged 12 feet deep at low water from the deep water of the river to its outer end, and for a distance of about 100 feet on each side. Being an old structure, an expenditure is required almost annually to keep it in passable condition. During the fiscal year 1902-03 the sum of \$1,100.80 was expended in rebuilding a length of about 130 feet of the western side of the shore abutment, putting additional fender piles on the sides, renewing the span beams, guard timbers, covering, &c., and rebuilding the roadway with broken stone and gravel.

#### RUSTICO.

Grand or North Rustico Harbour, in the County of Queen's, is situated on the north side of the island, about midway between East point and North cape; it is one of the most important fishing stations on the island. In order to improve the entrance of the harbour, which is obstructed by a shifting sand bar, the department, in 1881-2-3, constructed works on each side, for the purpose of concentrating the current at ebb tide and directing it upon the outer bar, and improve the depth of water by scouring, the effect was that 2 feet more water is now found on the bar than formerly. The depth of water on the bar is at present 8 feet at low or 11 feet at high water spring tides. The breakwater on the northern side also protects the inner low beach, on which most of the fishing stages and fish houses are situated. Originally it was 1,240 feet long, but the timbers having been weakened by the action of the teredo, it suffered severely during various storms, 120 feet of the outer end being carried away and the adjoining 150 feet much injured, the repair and reconstruction of this part of the work were made during 1893-4-5, the outer 120 feet, however, not being rebuilt reduced the length to 1,120 feet. A head block, 30 by 62 feet, was, however, added and the adjoining 140 feet widened and otherwise strengthened. This part, and also the outer block, have a slope of 1 in 1 on the seaward side.

The sheathing of the slope having been damaged, and some of the ballast washed out, the sum of \$108.26 was expended during the year 1902-3 in doing the necessary repairs.

#### SKINNER'S POND.

Skinner's Pond, Prince county, is on the north-west coast of the island, midway between Miminigash and North cape, being about 8 miles distant from each. It is about 3 miles from Harper's station, on the line of the Prince Edward Island railway. The pond, one of many of similar nature on the island, has a length of about 1 mile, and an average width of 500 feet, with a depth of 5 to 10 feet at ordinary pond level, which is about 4 feet higher than low water spring tides. The new channel made in the pond having proved unsatisfactory, the sum of \$30 was expended during the fiscal year 1902-3 in removing a portion of the dam placed at the original outlet.

#### SOURIS HARBOUR.

Souris harbour, King's county, is situated on the southern side of the island, about 16 miles west from East Point. It is important as a harbour of refuge and place of shipment. A breakwater was built here by the Dominion government in 1877; it has a length of 1,250 feet, of different forms and construction, for a description of which



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it may be divided into three sections, viz.:—Inner section 290 feet long, and 30 feet wide, built of close-faced timber with plumb sides, having on the seaward face a protection of stone, sloping 3 to 1, in an average depth of 7 feet at low water. Middle section 530 feet long, averaging 65 feet wide, also of squared timber built close-faced, with the upper 10 feet sloping 1 to 1 on the seaward face; this section stands in an average depth of 17 feet at low water, and has, during the past three summers, been having a stone slope formed on its outer or seaward side. The outer or third section of the breakwater is 390 feet long, and of close-faced timber, averaging 24 feet wide, and having on the seaward side a stone protection slope extending to within 3 feet of the top, and sloping 1 to 3. There is also a block 40 by 80 feet at the end of the work, constructed of close-faced creosoted timber fully ballasted, standing in a depth of 22 feet at low water spring tides. During the fiscal year 1902-3 the sum of \$19,680.12 was expended in building the stone slope of the second section.

## STEPHEN'S AND LAMBERT'S PIERS.

Stephen's and Lambert's piers, King's county, are situated on the southern side of the Montague river, immediately below the highway bridge at the village of Montague, and about 6 miles from where the river enters Cardigan bay. Lambert's pier has a frontage of 310 feet on the river channel, and consists of two sections, the upper or western section connects with the bridge, and is 140 feet long and 24 feet wide, built of cribwork on the inner side and pilework outside; the eastern section is entirely of pilework, 25 feet wide, capped, floor-stringered and planked over. Stephen's pier, which is immediately below Lambert's, has a frontage on the river channel of 100 feet; it consists of two wings or approaches about 50 feet apart, extending out from the bank of the river, and being respectively 90 and 115 feet long; they are built of close-faced timber; the space between them is now being filled with ballast discharged from vessels, from the bank of the river to the pier head that is formed of pile bents, floor-stringered and planked over. During the year 1902-3 the sum of \$299.45 was expended on general repairs of the covering of the piers; some new floor-stringers were also put in on the Lambert's pier.

## ST. MARY'S BAY.

St. Mary's Bay pier, King's county, is situated on the southern side of St. Mary's Bay, about 9 miles south of Georgetown. It was constructed originally by the local government, being one of the Prince Edward Island piers, the control of which was assumed by the Dominion government in 1884. Since that date the approach to it has been greatly improved, a channel from deep water and a basin at the outer end of the pier were dredged to a depth of 10 feet at low water; loading berths 50 feet wide and 100 feet long were also dredged out on both sides of the pier. The pier is in all 407 feet long, the inner 310 feet of this being 21 feet wide, and the outer 97 feet 28 feet wide. Originally it consisted of a shore abutment and seven blocks with intervening spans, but six of these have been filled in, only the outer one remaining. During the spring of 1903 the sum of \$549.85 was expended in effecting some repairs, the work done consisted in rebuilding 3 feet in height at the end of the pier head on a length of 25 feet, putting in new floor-stringers and covering, driving 21 fender piles, putting in four new mooring posts, and rebuilding the roadway with broken stone and gravel.

## ST. PETER'S BREAKWATER.

St. Peter's breakwater, King's county, is on the north coast of the island, about 35 miles west from East Point, and on the west side of the entrance into St. Peter's bay; the breakwater was constructed by the department in 1878 to improve the entrance and afford better shelter for fishing boats. It has a length of 226 feet, built close-faced



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solid timber work, fully ballasted, floor-stringered and planked over, and has its inner end connected with the sand hills or high ground by a beach protection or breastwork, 1,420 feet long, to prevent a channel being formed through the beach on its inner side. The outer end of the work having become damaged by the action of the teredo and running ice, for its temporary protection it was close-piled in 1899-1900. On September 26, 1902, a contract was entered into for the construction of an addition of 30 feet that will both give some further shelter as well as thoroughly secure the work. Materials were got out during the winter and construction was commenced in May. By the end of the fiscal year the block was about half completed and set in position. The expenditure was \$1,108.81.

## TIGNISH HARBOUR.

Tignish harbour, Prince county, is on the north or gulf coast of the island, about 6 miles southward from Cape North. The harbour is at the mouth of the Tignish river, which here enters the Gulf of St. Lawrence. On each side of the river's mouth the coast line for a long distance being quite straight, gales from the north-east to south-east throw in a very heavy sea, and this acting on the sand beaches frequently caused the entrance to become completely closed until it would be broken through on the occasion of a freshet or an unusually high tide. To keep the entrance open and to preserve the channel in one position, the Government of Prince Edward Island, in 1868, began the construction of works on each side of the river mouth, contracting this to a width of 40 feet. The effect was to increase the current and give a better depth of water. Since Confederation, the works having been assumed by the Dominion government, have been raised, repaired and extended. Beach protection works were built on each side, connecting the piers or breakwaters with the high ground so as to prevent the possibility of a channel forming at the back of either of them. During the past season the sum of \$732.41 was expended in rebuilding a length of 100 feet of the channel face of the northern breakwater. New floor-stringers and covering were put on, additional fender-piles were driven on different parts of the works, and the beach protection on the northern side was levelled.

## VICTORIA (CRAPAUD).

Victoria or Crapaud pier, Queen's county, is situated at the head of navigation in the Crapaud basin, at Victoria village, which is the most important place of shipment after Summerside on the south-western coast of the island. It is about midway between Charlottetown and Summerside harbours, and about 11 miles distant (south) from Emerald Junction on the line of the Prince Edward Island railway, and is the outlet of probably the most fertile and best tilled district on the island. At different times since Confederation the department has expended considerable sums in dredging to improve the approach from the deep water to the pier, and for repairs thereto. This pier has been under the control of the Dominion government since 1884-5. It has a total length of 486 feet, consisting of a shore abutment or approach 286 feet long, and 20 feet wide, a middle section 143 feet long, 37 feet wide, and a pier head 57 feet long and 58 wide its height is 19 feet at the outer end, where a depth of 9 feet is carried at low water. With the exception of the approach, which is built solid, the work is composed of alternate blocks and spans, floor-stringered and planked over. During the spring of 1902 the sum of \$199.13 was expended on repairs of the first and second spans and intervening block, on all of which new floor-stringers and covering were put on, and general repair made of the roadway approach.

## WOOD ISLANDS.

Wood islands, Queen's county, are situated about 30 miles south-east from Charlottetown, and 15 miles to the westward of Cape Bear, and are the most southerly part



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of Prince Edward Island. Originally two small islands, they are now connected together, and also to the shore by sand beaches. A sand spit extends out from the shore to within 300 feet of what had been the eastern island, forming within it and the western island and the connecting beaches a large shallow pond, having an area of about 300 acres, the outlet from which is at the east end of the eastern island.

Here the formation of a shipping place was commenced in 1859 by the provincial government, but as at no time were the works in good condition, little if any good resulted from them until 1894, when the reconstruction of the northern breakwater was effected by the department, and the southern one repaired. As this latter work, however, was too short, an addition was built during the year 1901-2. Its present length is 950 feet, and from 20 to 40 feet wide, while the northern work is 2,500 feet long and 20 feet wide.

After the extension of the southern work, the increased scour being in danger of causing undermining, the sum of \$3,008.16 was expended during the fiscal year of 1902-3 in close-piling the outer end and sides on a length of 200 feet, and putting in a brush mattress with stone filling on the seaward face. This breakwater being used as a shipping place, an approach to its inner end was constructed, having a length of 54 feet and 13 feet wide.

## PROVINCE OF NEW BRUNSWICK.

## ANDERSON'S HOLLOW.

Anderson's Hollow (Albert county) is a cove of Salisbury bay, on the north-west side of the Chignecto channel, in the Bay of Fundy. Spring tides rise  $40\frac{1}{2}$  feet; neaps,  $32\frac{1}{2}$  feet.

The breakwater wharf at this place was begun in 1879 by the construction of a detached block 550 feet from the shore, with which it was afterwards connected. In August, 1885, the work was 290 feet in length, and three years later was carried to the shore. The structure, 25 feet wide on top, was originally 27 feet high at the outer end, but the bottom having been raised by the accumulation of littoral drift, the height is now 3 or 4 feet less. It is built of round timber cribwork, lightly battered on the inside, but sloped at the rate of  $\frac{1}{2}$  to 1 and sheathed on the weather face.

The breakwater was damaged by storm on November 21, 1895, when a small lighthouse placed at the outer end was swept away, together with part of the break, while some of the top work at the head was simultaneously shaken and started.

In 1895-96 a small sum was applied to bolting loosened timbers for temporary security.

During the fiscal year 1896-97 the inside face of the wharf at the outer end, which had received a heavy list in the storm of the previous year, was taken down and rebuilt for a distance of 75 feet on top and 44 feet on the bottom. The list was taken out, the new face being carried to a height of 15 feet, in order to level the top, and new covering was laid for a length of 75 feet. Seventy feet out of 110 feet of dismantled break were reconstructed, and fenders were placed on the inside of the new face.

In 1898-99, by an expenditure of \$121.31, 27 pieces of new sheathing were laid and bolted to the sloping face, a new cap and face timbers were inserted, and the gap in the break 40 feet long, left unfinished at the time of the previous repairs, was built up with four tiers of timber strengthened with knees.

In 1900-01 the break-timbers, which had been started up from 3 to 9 inches by storms for a distance of 290 feet, were restored to position. For 25 feet at the outer



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end, the break was raised 1 tier; 8 bridles, 9 inches square, were placed between the knees of the break for a distance of 100 lineal feet; 3 new pieces of 6-inch sheathing were placed on the sloping face, and loose planks were secured with bolts. Through the shoal obstructing the work on the inside, a channel 300 feet long, 35 feet wide and 5 feet deep was made by means of a wheel scraper. It was found, however, that the shoal formed again rapidly with the recurrence of any south-west swell. A groyne, 50 feet in length, made of piling and 9-inch timber, was built on the outside of the work, in order to check for a time the accumulation of littoral drift on the inside.

During the year 1901-02 new sheathing, 6 inches thick and from 22 to 32 feet long, was laid and secured with  $\frac{7}{8}$ -inch bolts at different places along the weather face of the outermost 190 feet. Additional bolts were also driven to secure the old and loosened sheathing, while 71 pieces of new covering 6 inches thick, were placed on the top of the work.

During the fiscal year 1902-03 the weather face of the outer block, 100 feet long, having become decayed, was cut down nearly to the bottom and rebuilt for a width of 13 feet with heavy timbers secured in great measure with screw bolts, the outside being sheathed with 9-inch spruce. More than half the covering of this block was renewed. On it a new break was built 3 tiers in height for 26 feet; 2 for 61 feet and one tier for 13 feet in length. The covering was patched on other parts of the work.

Four new fenders were placed and the cap was renewed for a length of 47 feet. An extension of 50 feet, for which foundations were excavated through the shoals to the rock, was begun and brought up to a height of four tiers.

Like many other works in the Bay of Fundy, Anderson's Hollow crosses the direction of the flood stream and of the prevailing winds. In consequence, an accumulation of littoral drift is found on the south-west side which travels around the end, and is deposited under the lee of the breakwater, forming a shoal which is an obstacle to vessels.

The total expenditure to June 30, 1901, amounted to \$14,824.30.

The expenditure in 1902-03 was \$5,747.52.

#### BACK BAY.

Back Bay, Charlotte county, a fishing station about 4 miles west of L'Etang and 2 miles east of Letete, is situated on an arm of Letete harbour in the County of Charlotte. At this place the provincial government built a wharf of crib and trestlework, 239 feet in extreme length, extending nearly to low water mark. An extension to this wharf of 86 feet, comprising a pier head 50 by 30 feet of round-timber cribwork fully ballasted, sheathed on both sides for protection from ice, a block 20 feet square on top, and two spans of 18 feet, the whole carrying the end into 8 feet at low water, was added by the department during the fiscal year 1900-1. This work was built by contract and completed.

Back Bay is a regular place of call for one of the steamers of Passamaquoddy bay, running from St. Stephen to Eastport, Campobello, Deer island, Letete and other intermediate points. Spring tides rise 24 feet.

Towards the end of the year 1901-2 a landing to suit different heights of the tide was begun; a gallows for hoisting freight was built and a ladder placed against the face of the work.

In 1902-03 the steps on the north side of this new wharf, begun in the last fiscal year, were completed. To suit the different stages of the Bay of Fundy tides, the steps were provided with three landings at intervals of about 7 feet in vertical height.

The total expenditure up to June 30, 1902, amounted to \$7,459.46. The expenditure for 1902-3 was \$75.76.

#### BATHURST.

Bathurst, the shire town of the county of Gloucester, with a population of about 1,500, is situated at the head of the Baie des Chaleurs. It is a station on the Inter-



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colonial railway, about 120 miles north of Moncton, and the western terminus of the Caraquet railway. Bathurst is one of the north shore deal ports from which, during the last year, nearly 21,000,000 superficial feet of deals, &c., were shipped.

An appropriation was made by Parliament in 1901 for the construction of a new wharf at Bathurst, to be used for shipping lumber and other outputs of the district. After an examination of the place had been made, it was found that better facilities would be afforded at a less cost by acquiring and repairing the provincial government wharf, built many years ago on the eastern side of the public highway bridge connecting Bathurst town and Bathurst village. The provincial government subsequently waived all claim to the wharf, and plans were prepared for its reconstruction.

The old wharf consisted of three blocks and two spans, forming a total length of 174 feet, from 27 to 37 feet wide at top, with a depth of water along the channel side and outer end of 7 to 10 feet at low water. Spring tides rise 7 feet.

From a little above low water to the top the wharf needed considerable repairs, on account of the decayed state of the timbers. During the year 1901-2 the tops of the three blocks were rebuilt on an average height of 5 feet at a cost of \$1,996.02.

During the fiscal year 1902-3 the cribwork on the blocks was completed, three tiers of timber being placed on each. Seven rows of 12 by 12 and 10 by 12-inch stringers were placed over the spans and blocks respectively. The whole of the top of the work, 174 by 35 feet, was covered with 4-inch plank, 10 by 12 caps were placed along both sides and the outer end, and 59 fender-piles were driven around the work. The blocks were filled with ballast, and their exposed sides, forming a total length of 163 feet, were sheathed with 4-inch spruce planks.

The expenditure for the fiscal year 1902-3 amounted to \$1,069.29. The total expenditure to June 30, 1903, was \$3,065.31.

## BAY DU VIN.

Bay du Vin, Northumberland county, is situated on the southern side of the inner Miramichi bay, 20 miles below Chatham, and almost opposite Burnt Church.

A wharf 760 feet long was constructed at Bay du Vin between the years 1891 and 1894 by the provincial government. It consisted of an approach 80 feet long and 19 feet wide on top, thirteen blocks, generally  $20\frac{1}{2}$  by  $19\frac{1}{2}$  feet, fourteen spans or openings of 23 to 25 feet, and an outer block 80 by 30 feet.

Shortly after construction a length of 283 feet was swept away and a portion of the remainder damaged.

In May, 1901, a contract was entered into for the reconstruction of the part carried away, this to consist of four blocks 25 feet square and an outer block or pier head 83 feet long and 30 feet wide on top, and five intervening spans of 20 feet, a total length of 283 feet. The blocks and pier head were required to be built of round-timber open cribwork, filled with stone ballast, the openings to be spanned with 12 by 12 stringers, the top covered with 4-inch plank and the sides and ends of the outer block sheathed with 7-inch hardwood. The outer end of the wharf is in a depth of 8 feet at low water.

At the close of the year 1901-2 the first two blocks were built respectively 10 and 11 feet high, and were ready to receive the stringers. The third block was built 13 feet high, or to within 3 tiers of timber of the required height, and the pier head was constructed 16 feet high or to within 2 tiers of timber of the required height, while the crib of the fourth block was under construction, but not placed in position.

In July, 1902, an agreement was entered into with the contractor to fill in with cribwork the opening between the pier head and the fourth block, the work to be similar in construction to the other blocks. The amount agreed upon for the construction of the extra work was \$575.

The contract was finally completed on September 19, 1902.

The expenditure for the fiscal year 1902-3 was \$4,004.95. Total expenditure to June 30, 1903, was \$10,447.44.



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## BLACK BROOK.

Black Brook (or Loggieville), Northumberland county, is situated on the southern side of Miramichi river, 6 miles below Chatham. It is the terminus of the Canada Eastern railway, and a port of call for the steamers of the Miramichi Steam Navigation Company.

During 1901 the department constructed a wharf at Black Brook, immediately below the Bently wharf so called. It consists of an approach or stone embankment 172 feet long and 20 feet wide on top, with slopes of 1 to 1 on the sides, a span of 15 feet and a pier head 25 by 40 feet of close faced timber work, forming a total length of 212 feet, with the outer end in a depth of 10 feet at low water. The top of the approach was finished with cross ties placed 8 feet apart, filled between with earth and gravel, and at the end of the ties, cap timbers were placed on each side of the work. The wharf was completed in October, 1901.

During a high tide, accompanied by a heavy storm soon after the work was completed, the earth and gravel were washed off the top of the approach, and the cross-ties and cap timbers were displaced.

During the fiscal year 1902-03 the cross ties and cap timbers were replaced in position and the ends of the ties secured to the upper stones of the slope with blind wedged bolts. Earth and gravel were again placed between the ties to a depth of 3 inches above the top of same, all openings on the sides were closed to prevent the gravel from working out, and a plank walk, 3 feet wide, was placed along the lower side of the wharf. A pile bulk head, 18 feet long and 9 feet wide, braced with walings and ties, was built from the lower corner of the Bently wharf to the inner end of the span of the departmental work, and the whole space, 120 feet long and from 10 to 20 feet wide, was filled with brush and stone, the top was finished with gravel level with the top of the departmental wharf.

The expenditure for the fiscal year 1902-03 amounted to \$1,007.42.

The total expenditure to June 30, 1903, was \$5,743.21.

## CAMPBELLTOWN.

Campbelltown, Restigouche county, a deal port from which 24,142,117 superficial feet of lumber was shipped in 1902, and an incorporated town of some 3,000 inhabitants is situated on the southern side of the Restigouche river, in the county of the same name. It is directly opposite Cross Point in Bonaventure county, P.Q., 14 miles above Dalhousie, the shire town of the county, 6 miles below the head of tide water. Spring tides rise 11 feet.

In 1889 the department constructed a block, 140 feet long and 34½ feet wide on top, of close-faced cribwork, 108 feet below what was then known as the Ferguson wharf. and in 1892, another block of similar construction and width, to close the opening between the two works, giving a total frontage to the departmental wharf of 250 feet, with a depth of 12 feet at the outer face.

After the construction of the second block, the Ferguson work was sold to J. P. Mowat, and subsequently by him to Kilgour Shives.

As access could only be had to the departmental work by traversing the Shives' wharf, steps were taken in 1901 towards the acquisition of the latter, and as the work was in need of repairs, materials were procured at a cost of \$2,224.32 during the same year, to effect such necessary repairs, but the work was not commenced owing to the property not having been acquired.

During the fiscal year 1902-03, however, the wharf became vested in the Crown, and repairs are about being commenced.

The sum of \$226.50 was expended in caring for and looking after the timber procured for repairs.

The total expenditure to June 30, 1903, amounted to \$23,023.83.



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## CAPE TORMENTINE.

Cape Tormentine, Westmoreland county, is situated on the south-western side of Northumberland strait, at the extreme eastern end of Westmoreland county. It is the terminus of the New Brunswick and Prince Edward Island Railway and the nearest point of communication between Prince Edward Island and the mainland, the distance being 9 miles.

With a view to forming an artificial harbour for purposes of interprovincial communication between the island and the mainland during the winter, a breakwater pier was constructed by the department between 1886 and 1892.

The structure comprises a straight pier (or approach) 2,500 feet long, the first 1,300 feet of which is a rubble mound 20 feet wide on top with pitched slopes of 2 to 1, and the remainder of close-faced cribwork, 30 feet wide on top, a pier-head and return of similar construction, each 400 feet long and 40 feet wide from the base up to a little above low water, then decreasing to 30 feet at the finished top, which is 4 feet above high water spring tides. Between low water and the top of the work, the head and return present a sloping face sheathed with hard wood to the east and south. The whole incloses a basin or harbour of about 4 acres in area with depth, up to the fall of 1892, of 13 to 15 feet at low water, but increased since then over a section of same by dredging to 18 feet.

Spring tides rise  $7\frac{3}{4}$  feet, and neaps  $3\frac{1}{4}$  feet.

Owing to the ravages of the teredo, repairs became necessary to the timber section of the work soon after its completion and have since been carried on annually. They have consisted mainly in renewing the face timbers and sheathing of the sloping faces of the pier head and return, protecting the north and portion of the south faces of the approach and about 300 feet of the outer face of the head, with large and small stone, and driving close piling along a portion of the south side of the approach.

During 1901-02 a temporary quay face 180 feet long was constructed along the outer or south face of the return, to afford landing facilities for the steamer 'Stanley' plying between Cape Tormentine and Prince Edward Island during the winter.

This work consisted of piles driven every 4 feet along the outer face and of hardwood timber cribwork tied into the old work. Repairs were also made to different sections of the sloping face. Over 5,000 cubic yards of large and small stone were deposited along the northern and eastern faces of the approach and head; 361 creosoted piles were driven, generally  $2\frac{1}{2}$  feet apart, along the harbour sides of the pier, and a building 100 feet long and 25 feet wide, for the reception of freight and also affording waiting-rooms, was built on the return section of the work, and 35,000 feet B.M. of timber were delivered for levelling up 250 feet of the approach, which had become much settled, consequent upon the action of the teredo.

During the fiscal year 1902-3 750 feet of the top of the approach were stripped of the old covering and levelled up from 6 inches to  $2\frac{1}{2}$  feet by placing new cross ties, stringers and face timbers, all of which were treated with carbolineum; over a section of 115 feet, the bays on the south side from which the ballast had washed out, was refilled with stone, and 75 creosoted piles were driven  $2\frac{1}{2}$  feet apart along the dock faces, and 24 creosoted and 3 hardwood piles along the outside of the quay face built in 1901-2. The quay face was extended westward 25 feet, this consisting of piles braced by walings and cross ties with the latter tied into the old work. At the south-east corner two rows of close-piling (73 piles in all) were driven and secured above low water by walings and braces tied into the old work, and further secured with four iron straps, the void between the piling and the old work was filled with about 230 cubic yards of stone ballast and the top covered with  $4\frac{1}{2}$ -inch plank. The quay face was protected with boiler plates on a length of 200 feet. A movable platform 20 feet long, 8 feet wide, was built from the eastern end of the new freight shed along the head of the pier. A portion of the freight shed was shingled and other minor repairs were executed. New face timbers and sheathing were placed on a length of 80 feet of the



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sloping face, a new mooring post was placed in the outer end of the pier and 1,949.9 cubic yards of large and about 450 yards of small stone were deposited along the north and south faces of the approach and head of the pier.

The expenditure during the year 1902-03 was \$14,788.21, and the total expenditure on this work to June 30, 1903, amounts to \$303,191.

## CARAQUET.

Caraquet, Gloucester county, a thriving fishing settlement and a station on the Caraquet railway, is situated on the southern side of Baie des Chaleurs, 42 miles east of Bathurst, the shire town of the county.

For the purpose of establishing a deep water terminus for the shipment of lumber manufactured in the locality, a contract was entered into in March, 1902, with Messrs. Simmons & Burpee, of Maryville, N.B., for the construction of a block and span wharf 1,700 feet long, with a depth, along the outer 300 feet, of 22 feet at low water. Spring tides rise 6 feet.

The wharf is to consist of an approach or shore block 255 feet long and 25 feet wide on top, 25 blocks, 25 feet square on top, with sides battering 1 in 9; a pier head 300 feet long and 40 feet wide, and 26 spans or openings of 20 feet each. The blocks are to be constructed of round timber open cribwork, and the openings spanned by double 12 by 12-inch timbers.

The work of construction was commenced on July 7, 1902, and at the close of the fiscal year 1902-03 had progressed as follows: The approach or shore block and blocks Nos. 1 to 5 inclusive were completed, ready to receive the corbels and stringers; block No. 6 was constructed to within one tier of cross-ties of the required height, and blocks Nos. 7, 8 and 9 were built eight tiers high and placed in position.

The expenditure for the year amounted to \$5,627.34.

## CHOCKFISH.

Chockfish river, Kent county, empties into Northumberland strait about midway between the entrances to Richibucto and Buctouche harbours.

For the purpose of diverting the course of the outlet of the river, which is circuitous and obstructed by a bar at the mouth, and to obtain a straight entrance and afford shelter for fishing boats, the construction of a dam was commenced in the autumn of 1901. It was built outward easterly, from the western shore, a distance of 130 feet or to within 75 feet of a sand bar separating the river from Northumberland strait.

Before the work was commenced, the channel followed the western side of the river. During the construction of the dam, this channel worked easterly keeping pace with the outer end of the work as it progressed.

In resuming work in 1902-03 construction was commenced on the bar, running westerly 203 feet, and there connected with that built the previous year. This work consists of brush mattresses, generally 40 feet wide and 3 feet in thickness, upon which a rubble mound is built with slopes on each side of  $1\frac{1}{2}$  to 1 and 7 feet wide on top. Before depositing the stone, two longitudinal rows of piles were driven 7 feet apart and 5 feet centre to centre longitudinally; 70 piles were driven and 400 cubic yards of stone placed in the new and partly over the old work. The top of the rubble mound is generally 3 feet above the level of high water. A trench was cut through the beach about 300 feet above the dam which, with the assistance of the spring freshets, has become a new channel about 70 feet wide, giving a depth of 9 feet at high water, a better entrance than ever afforded at the place.

The expenditure during the fiscal year 1902-03 amounted to \$1,839.70.

The total expenditure to June 30, 1903, \$2,771.09.



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## CLIFTON.

Clifton or Stonehaven, Gloucester county, a station on the Caraquet railway, is situated on the southern shore of the Baie des Chaleurs, 18 miles east of Bathurst, the shire town of the county, and 8 miles west of Gránd Anse.

A breakwater at Stonehaven, originally 425 feet long and constructed by private persons, was acquired by the department in 1878, and during the same year was extended 325 feet, making a total length of 750 feet. The outer 220 feet are placed at an angle of 72 degrees, with the inner portion and the whole constructed of round and square timber cribwork filled with stone and partly protected along the northern and eastern faces by a stone talus. The harbour affords shelter for fishing vessels, the depth at low water being 7 to 8 feet. Spring tides rise 7 feet.

During 1886-87, 1887-88, between 1891-93 and again in 1897-98 and 1898-99, general repairs were made to the work, and a portion of the northern and eastern faces to the south and west of the angle were protected by large stones of from  $\frac{1}{2}$  to 1 cubic yard in bulk.

In 1899-1900 two openings in the eastern face, 16 and 19 feet wide, were closed and other repairs were made; materials were also procured for the construction of a block 70 by 40 feet at the western end of the breakwater, for the purpose of preventing the stone placed along the northern face being swept westerly during easterly storms. During 1900-01 the timbers for the proposed block were framed and the old work was repaired on a length of 103 feet.

In 1901-02 the top of the outer 200 feet of the breakwater was stripped and new longitudinals, cross ties and covering placed; a tramway was built along the northern face; 719 cubic yards of stone were placed along the northern and eastern faces, and other minor repairs made at different sections of the work, in renewing where necessary cap fenders and face timbers. Also the substructure of the new block 70 by 40 feet of close-faced cribwork, was constructed 11 tiers or 9 feet 2 inches high, and successfully placed at the western end of the breakwater.

During the fiscal year 1902-03 the construction of the new block was completed, necessitating the following work: placing and securing 10 tiers of 10 by 12 face timbers (8 feet 4 inches high), 5 tiers of cross ties, 4 tiers of longitudinals, 8 rows of 12 by 12 stringers, covering the work with 6-inch spruce planks, 12 by 12 cap timbers around the sides and ends, three 10 by 10 fenders on the corners and single ones 7 feet apart on the four faces, 3 iron straps on each corner and ballasting to the under side of the covering.

Thirteen new 10 by 12 fenders 15 feet long were placed on the northern face of the old breakwater, and 900 cubic yards of large stone were deposited along the same face, between the angle formed by the new block and the north-east corner of the old work.

The expenditure during the fiscal year 1902-03 amounted to \$2,500.

The total expenditure to June 30, 1903, was \$290,786.44.

## COLE'S POINT.

Cole's Point, Westmoreland county, in the parish of Dorchester, is situated at the head of Shepody Bay, on the eastern side of the mouth of Memramcook river; it is distant about 3 miles south-west of Dorchester, the shire town of the county.

To facilitate the shipment of lumber, also to serve as a protection to vessels and as a landing for the ferry service between Hopewell Cape, in Albert county and Cole's Point, a contract was entered into with J. B. McManus, of Memramcook, in 1901, for the construction of a wharf off Cole's Point, the same to consist of (a) round timber open cribwork 180 feet long and 20 feet wide on top; (b) round timber open cribwork 260 feet long and 25 feet wide on top; (c) round timber open cribwork 168 feet long and 30 feet wide on top with double face timbers sheathed with 6-inch hardwood plank, and (d) a pier head 60 feet long, 30 feet wide on top and 33 feet high, constructed of round timber open cribwork with double face timbers, and sheathed on all sides with 6-inch



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hardwood. The total length of the work is 638 feet, covered with 4-inch planks. The depth of water at the outer end is 29 feet at high water. The work of construction was commenced in April, 1902, and completed on December 13 of the same year.

The amount expended during the fiscal year was \$23,233.62.

The total cost of the work was \$27,622.

## FORT DUFFERIN.

Fort Dufferin, St. John county, a 10-gun battery built by the Imperial government to command the western entrance to St. John harbour, stands on high ground immediately above the end of Negropoint breakwater. In order to preserve from erosion by the waves the head line crowned by the battery, this department began in 1882, at tide level, a retaining wall of sheathed cribwork 430 feet in length, and in the following year constructed a further length of 303 feet. The work is exposed on the one hand to the force of the waves, and on the other hand to land slips.

In 1886-87 it was much disturbed by the sea, and repairs were made in that and the following years, 205 feet of the original work being rebuilt. From 1887 to 1889 repairs were also made, and in 1890 the work was extended 100 feet.

General repairs were made in 1893-94. The work is from 7 to 14 feet on top, and about 9 feet in mean height. The crest for the whole length is surmounted by a break  $2\frac{1}{2}$  feet high.

During the year 1896-97 a gap 81 feet long in the break was repaired, 200 lineal feet of longitudinals were renewed inside, and 128 cubic yards of ballast were restored to the work, while the sheathing was patched at intervals along the face with hardwood planking. In order to raise the beach, and so protect the lower part of the face, towards the end of 1896, a groyne 40 feet long, 10 feet wide and 4 feet in average height, was built of hardwood piles, timber and stone. In 1897 extension of the cribwork a distance of 130 feet was begun, and by the end of that fiscal year had been brought within two tiers of the full height.

In 1897-98 the new extension was completed, ballasted and sheathed. Small repairs were also made to the sheathing of the old work.

In 1898-99 four groynes, in all 232 lineal feet, each built of hardwood piles spaced four feet apart, driven from 9 to 12 feet into the bottom and planked with birch 9 inches square, securely strapped and bolted, were placed along the beach to protect the lower part of the sheathing of the breastwork; some ballast was also placed in the cribwork.

Ordinary repairs, comprising restoration of a breach in the face, ballasting and renewal of sheathing, were made during the year 1899-1900.

In 1900-01 the face was sheathed for 145 lineal feet; 10 piles were driven to restore, with the addition of cribwork, a breach 11 feet long; 62 lineal feet of large hemlock face timbers were inserted, some loose piles were rebolted, and 373 cubic yards of ballast were placed in the work. At the upper end, the breastwork was repaired for a distance of 235 feet by placing a new tier of 12-inch cross ties, 395 lineal feet of face timbers, and by the insertion of 24 knees, with as many chocks, secured by screw bolts.

In 1901-02, 136 spruce plies, 26 feet long were driven from 6 to 8 feet into the bottom for a distance of 108 feet along the face of the breastwork. In another place, for a total length of 126 feet, the face was sheathed with 6-inch spruce, and the old sheathing was patched at intervals for a length of 210 feet. A break 3 feet in height was also constructed of 4 tiers of spruce timber, supported at intervals of 10 feet by 21 framed braces, made of 8 by 8-inch spruce. Some brush was deposited at the back of the innermost block of cribwork, and beneath the adjacent groyne, for the purpose of assisting the accumulation of silt and drift.

In 1902-03 the face of the breastwork was protected with close piling for a length of about 178 feet; 14 pieces of spruce sheathing were applied to the work and about 40 cubic yards of ballast were placed. An extension of the protection was made for a distance of 94 feet by driving close piling, secured with double walings and stiffened by



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bracing, fastened to piles driven 13 feet in the rear. The inside of this work was partially filled with brush and stone.

The total expenditure to June 30, 1902, amounted to \$24,632.01.

The expenditure for the fiscal year 1902-03 was \$2,039.63.

## GRAND ANSE.

Grand Anse, Gloucester county, a station on the Caraquet railway and a fishing settlement with a population of between 700 and 800 inhabitants, is situated on the southern shore of Bay des Chaleurs, 25 miles north-east of Bathurst, and 15 miles west of Caraquet.

For the purpose of affording shelter to the fishing boats of the locality and others frequenting Bay des Chaleurs, the department, in 1876, commenced the construction of an isolated breakwater placed between 500 and 600 feet from the shore, and subsequently extended it to a length of 397 feet, 159 feet of which forms a shore arm, and the remaining 238 feet nearly at right angles to the former, a head with a sloping face of 1 to 1 on the north or seaward side.

With a view of giving increased protection to the fishing boats, a contract was entered into during 1901-02 with J. W. Dumas, for the construction of an extension of close-faced cribwork 250 feet long,  $21\frac{1}{2}$  feet wide, and from  $10\frac{1}{2}$  to  $13\frac{1}{2}$  feet high to extend from the inner end of the present work shoreward, also for the removal of materials, consisting of sand, mud and stones which had accumulated inside the harbour formed by the original work.

At the close of the fiscal year 1901-02 the extension was constructed an average height of  $7\frac{1}{2}$  feet on a length of 257 feet, the required length of the work at the bottom, and 30 cubic yards of material had been removed from the area required to be dredged.

During the year 1902-03 the extension was completed, and 1,470 cubic yards of dredging was performed. The latter was carried on during the winter through the ice. The appliance used, however, was not suitable to complete the work after the opening of navigation, and a dredge better adapted to perform the same was engaged, but owing to unfavourable weather, had not reached Grand Anse at the close of the fiscal year. This portion of the contract, therefore, yet remains to be completed.

Repairs were also made to the old work during the year, viz. : driving 6 fender piles and rebolting 7 loose ones on north or outer face; stripping 20 feet of sloping face; inserting 5 new face timbers, 10 yards of ballast and renewing part of the sheathing; placing a ladder on and close fendering two sections (10 feet each) of the inner face of the head of the breakwater with 10-inch hardwood.

The amount expended during the fiscal year 1902-03 was \$4,586.98.

The total expenditure to June 30, 1903, was \$31,515.42.

## HERRING COVE.

Herring Cove, Albert county, is situated  $11\frac{1}{2}$  miles west of Cape Enragé, forming the western extremity of Salisbury bay, an indentation of the Albert coast of the Bay of Fundy. Spring tides rise 37 feet and neaps 30 feet.

A breakwater, 215 feet long, 31 feet wide on top, and 43 feet high at the outer end, was built at this cove by the department in 1873 at a cost of \$13,113.45. The inside face of the work is of square timber, while the outside, strongly battered, is of round timber, close fendered. Founded on a reef under the lee of Mathew's Head and directed towards Owl's head, the work trending towards the land, lies in the general direction of south-west waves, and affords during storms some slight protection from the undertow to small craft, if beached in the extreme angle of the cove.

The cove is notable for good holding ground, and is one of the two places on the New Brunswick coast of the Bay of Fundy, east of St. John, considered to possess natural features favourable for the construction of a harbour of refuge.



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Vessels carrying deals from Alma to the United Kingdom anchor in the roadstead off this breakwater to receive cargoes by lighter from Alma, two miles distant, the terminus of the Albert Southern railway, and from other places.

During the year 1896-97 repairs were made to the upper works of this breakwater, in consequence of the decay of the timber from age. In that year, the cribwork break extending the whole length of the work was removed and rebuilt, while the decayed part of the close fendering was almost entirely replaced by sound material, the expenditure amounting to \$990.75.

During 1897-98 the work performed consisted on placing five rows of new floor stringers, each row extending for 200 feet; in laying about 18,000 feet B.M., of new covering on the top of the breakwater; in renewing the cap timbers, 12 inches square, for a distance of 160 feet; in placing 15 new fenders, varying from 13 to 20 feet in length, and in completing the repairs to the close sheathing of the seaward face by the addition of 51 pieces from 5 to 9 feet in length. At the same time, 82 cubic yards of rock were blasted from a reef which prevented vessels from going alongside the work. This work was executed by an expenditure of \$500.

In the fiscal year 1902-03 twenty pieces of sheathing, which had been carried away by storm from the weather place, were replaced at a cost of \$35.

The total expenditure to June 30, 1902, amounted to \$14,603.70.

The expenditure during the fiscal year 1902-03 was \$35.

#### HOPEWELL CAPE.

Hopewell Cape, Albert county, near the mouth of the Petitcodiac and at the head of deep water navigation, is one of several works intended for convenience of shipping in that large tidal river. Spring tides rise 45 feet.

In 1901 the construction was begun by contract of a new wharf intended to be 460 feet in total length, consisting of an approach of round timber cribwork, 210 feet long, together with square timber cribwork 250 feet long, which includes a pier head 50 by 35 feet on top and 48 feet high. By July 1, 1902, the cribwork and trestling of the approach had been built, and the pier head had been brought up to the 15th tier; while the square timber cribwork had been extended to a total length of 210 feet.

During the fiscal year 1902-03 the work was brought up from the 15th to the 46th tier or to the top, and the wharf was completed. As spring tides rise 45 feet, a movable slip was, by request, placed on the pier head for convenience of the traffic at the varying stages of the tides. Brush and stone protection was also applied to the outside of the pier head, the soft bottom of the Petitcodiac having scoured by action of the current. Some boulders scattered among the mud on the foreshore where vessels lie at low water, were removed.

By a fire which destroyed part of the village of Hopewell Cape, the top of the inner end, 300 feet long, of the old or ballast wharf was burnt. The fire obtained lodgement in the decayed or internal timbers of this work, and was with some difficulty extinguished in time to save the outer end of the wharf, which is built of square timber cribwork.

The expenditure to June 30, 1902, on the ballast wharf was \$10,742.19, and on the new wharf \$6,985.25.

The expenditure on the ballast wharf for 1902-03 amounted to \$25.63, and on the new wharf \$16,569.

#### HOPEWELL HILL.

At Hopewell Hill, in Albert county, on Shepody river, an arm of the Petitcodiac, a contract was let in 1900-01 for the erection of a new public wharf of round timber work. Construction was commenced in June 1901, and the work was completed in November of the same year. The wharf, 101 feet in total length, consists of a stone



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approach 24 feet long and 30 feet wide on top; 2 blocks, each 20 by 40 feet, and two intervening spans of 15 feet. The blocks are of open cribwork, planked on top, and fendered on the sides.

In the fiscal year 1902-03 a right of way to the wharf, 66 feet wide, was acquired, and a road, 500 feet long and 20 feet wide on top composed of alternate layers of brush and clay, was built. The road, which is outside the dykes, is altogether in embankment, the fill being 10 feet in maximum depth. The works comprehends 2,216 cubic yards of brush and clay in about equal parts. In the deepest part of the filling a culvert 32 feet long was built. The road was not quite finished at the upper end, but will be completed from local funds.

The total expenditure to June 30, 1902, amounted to \$4,102.94.

The expenditure for the fiscal year 1902-03 was \$504.93.

## LAMEQUE.

Lameque, Gloucester county, a fishing settlement from which large shipments of fish are annually made, is situated on Shippegan Island, on the eastern side of Shippegan Harbour.

In 1899-1900 a contract was entered into with Arcade Landry, of Shippegan, for the construction of a wharf at Lameque 990 feet long, affording a depth of 9'8 feet at low water at the outer end and consisting of an approach or shore block 220 feet long and 25 feet wide, 16 blocks 25 feet square, a pier head 30 by 40 feet, all constructed of round timber open cribwork fully ballasted and fendered, and 17 spans or openings of 20 feet spanned by 12 by 12-inch stringers. The whole was to be covered with 3-inch planks.

During the year 1900-01 the shore block was constructed up to  $1\frac{1}{2}$  feet above, and the first five blocks from 1 to  $1\frac{1}{2}$  feet below the level of high water.

Spring tides rise 5'8 feet.

Considerable progress was made with the work between July and December, 1902, the shore block being completed ready to receive stringers, and the other blocks constructed as follows: No. 1 to 2 feet, and Nos. 2 to 6 to one foot above the level of high water; Nos. 7 to 10 to within 1'8 feet; Nos. 11 to 14 to within  $2\frac{1}{2}$  feet and Nos. 15 and 16 to within 3'8 feet of the level of high water.

In the spring of 1902, during a heavy north-westerly wind, the work was severely damaged by drifting ice.

During the year 1902-03 the damage caused in the spring of 1902 was repaired, and the whole work was satisfactorily completed in January, 1903.

The expenditure during the fiscal year 1902-03 was \$5,904.84.

Total expenditure to June 30, 1903, was \$11,331.13.

## LITTLE SALMON RIVER.

Little Salmon river, Albert county, a tidal inlet of the Bay of Fundy, 14 miles east of Quaco, in the County of St. John, is the site of a mill producing lumber to the value of about \$25,000 annually. At this place springs rise 30 feet. The beach protecting this little haven being in danger of denudation, a protection work, 430 feet long, with a groyne 92 feet long, of piles and planking, extending along the crest of the beach, was built during the fiscal year 1902-03.

The expenditure during the year 1902-3 and the total expenditure at this place amounted to \$799.48.

## LORD'S COVE.

Lord's Cove, Charlotte county, a small fishing settlement on Deer island, is a port of call for steamers plying between St. Stephen, St. Andrew's, Eastport and other points



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on Passamaquoddy bay. To afford facilities for this steamer, the construction of a wharf was begun in 1900-1. Spring tides rise 24 feet.

The wharf, without the approach, is intended to be a pile and trestle work, 328 feet long and 21 feet wide, with a pier head 33 feet in height.

During the fiscal year 1902-3 this wharf was extended to the back of the pier head, a length of 120 feet, by driving 12 bents and by completing the laying of the covering and the cap. A gallows frame ladder and flight of steps were also made, in order that the public might make immediate use of the wharf. The work is now 289 feet long, exclusive of the stone approach 28 feet in length, and is reached by a rock cutting 61 feet long. The pier head, for which the piles have been procured, remains to be built.

The total expenditure up to June 30, 1902, amounted to \$2,000.

The expenditure during the fiscal year 1902-3 was \$1,000.

#### MIZZONETTE.

Mizzonette, Gloucester county, lies at the extreme eastern end of a small peninsula that separates the upper or western end of Caraquet harbour from Baie des Chaleurs, and is directly opposite the village of Caraquet, a station on the Caraquet Railway.

To accommodate the residents of the district, the department, in 1889, constructed a landing wharf 500 feet long off from Mizzonette Point. It was made up of a shore block 76 feet long and 12 feet wide, 12 blocks 12 feet square on top, a pier head 20 feet square, and 13 openings of 20 feet each. The blocks were constructed of open cribwork, the openings spanned by 10 by 12-inch stringers, and the top covered with 3-inch plank. The outer end stands in about 2 feet at low water.

Owing to decay and damage, and as the same depth of water was found 200 feet inward of the outer end as at the end, that portion was abandoned in 1897-8, and a new block 17 feet long and 12 feet wide was built on the eastern side of the seventh block, to form a new pier head. Slight repairs were also made to the remaining portion.

Spring tides rise 6 feet, neaps 4 feet.

During the fiscal year 1902-3 the portion of the wharf to be maintained having become almost impassable on account of decay, repairs were undertaken and were effected as follows:—The top of the work, for a length of 342 feet was removed; the approach, for a length of 50 feet, was levelled up with earth and gravel; in the next 110 feet, which now constitutes the shore block, 7 new cross-ties and one tier of face timbers were renewed, and longitudinals were placed in the outer 45 feet. In block No. 1, 3 cross-ties, 2 corbels and 2 face timbers were placed; in block No. 2, 3 cross-ties and 1 corbel; in blocks No. 3 to 7, levelling chocks were placed and the stringers, planking and cap pieces were renewed on this whole length of the wharf. Fenders were placed on five of the blocks and all were filled with stone ballast.

The expenditure for the fiscal year 1902-3 amounted to \$697.61.

#### NEGRO POINT.

Negro Point, St. John county, is a headland about 60 feet above high water mark at the western entrance to St. John harbour, which is formed by the estuary of the River St. John on the northern side of the Bay of Fundy. Spring tides rise 25.33 feet. Neaps 15 to 20 feet.

In addition to convenience of position for distribution by rail of cargoes landed at the city of St. John, the harbour is remarkable principally for great tidal range, and for consequent freedom from ice in the winter months. The harbour is open, broadly speaking, from south-east to south-west, but southerly winds are broken by Partridge island and south-west waves are mitigated by Negro Point breakwater, while the Foul Ground, a shoal tailing down from the peninsula on which the city is built,



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must have more or less effect in moderating the force of the easterly seas rolling round Mispic Point.

By Partridge island, a rocky eminence devoted to quarantine and lighthouse purposes, the entrance of St. John harbour is divided into east and west channels. In the former, or main channel, a minimum navigable depth of 19 feet is found on the bar at low water at ordinary spring tides. Two hundred yards inside the crest of the bar a depth of 5 fathoms is obtained in the narrow fairway, while higher up and between the most southerly of the principal wharfs on either side of the harbour (450 yards wide at that point), 12 fathoms are given in mid-channel.

The west channel 10 to 14 feet deep at low water, and originally 1,200 yards wide, has been contracted to about as many feet in breadth by Negro Point breakwater, which extends 2,200 feet south-east by south from the headland so styled.

The reasons for undertaking this work are thus stated in the reports of the Minister of Public Works for 1875 and 1882.

'1875—This breakwater extends south-easterly from Negro Point at the western entrance of St. John, when completed it will extend a distance of 2,250 feet, closing the west channel to that extent, leaving, however, a width of 1,100 feet between the outer end and Partridge Island. The object is to break the force of the seas which roll into the harbour of St. John, during the south-west gales in the Bay of Fundy, and which render it dangerous and almost impossible at such times for vessels to make the harbour.'

'1882—South-westerly winds threw in a heavy sea through the western channel, which rendered it difficult for vessels to make the harbour, as they were in danger of being carried on the "Foul Ground" on the eastern side of the channel. In the spring of 1875 a breakwater 2,250 feet long to partially close the western channel, was begun, and in September, 1877, completed.'

Reference to the chart will show that as long as the present opening remains, the object of the breakwater has been only partially fulfilled. In dealing with the reduction of the bar, a more cogent reason than improvement of shelter may be found for the extension of the work to Partridge Island.

The breakwater consisted at first of a cribwork core, 30 feet wide at the base, and 15 feet wide at the top (5 feet above high water ordinary spring tides), protected on both sides by large stones sloping to seaward at the rate of two to one, and landward at the rate of one to one. In the month of February, 1879, 1,300 lineal feet of cribwork were swept away to a depth varying between 13 to 19 feet from the top, the stones having been raked down by the wave action to a slope more nearly resembling the angle of repose of the material.

In 1880 temporary repairs were made, and in 1881 a contract, completed six years afterwards, was entered into whereby the lost cribwork was replaced by heavy stones, and the seaward slope made three to one. Even this flatter inclination proved too steep for stability; consequently, notwithstanding their size, the stones though smoothly laid, were soon displaced by the sea. A length of 50 feet of the breakwater extending at full height beyond a masonry pier, built under the same contract to support a beacon, was also swept away. From 1891 to 1894 desultory repairs were made by the addition of large stones, chiefly deposited about the end to prevent the lighthouse from being undermined.

In May and June, 1895, four large blocks of concrete were placed for the same purpose in front of the base of the pier. In 1895-96 seven concrete blocks, founded at about the level of low water neaps, were built in situ round a quadrant of the outer end to receive the foot of a slope proposed to be made of heavy granite blocks laid at the rate of four to one. The concrete blocks were from 59 to 91 tons each in weight, all but the heaviest being laid in one tide. The granite pier was also reinforced by a semicircular skin of concrete 7 feet in average thickness and strongly battered, placed round the front, and brought to the level of high water springs. The footing blocks were 15 feet long, 12 feet wide, and unless varied for the sake of the foundation, 3 feet high in the



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face, sloping upward at the rate of four to one on the top. Each block was free to settle independently, but all were keyed together by splayed concrete joggles. Inside a part of the space within the quadrant stones of the original work added to small granite were assembled and grouted, as far as funds permitted. This course was taken in default of the heavy granite (which would require special plant), necessary for the slopes of this breakwater, where weight is the great desideratum.

Pending consideration of works necessary for deepening the entrance of the harbour, which might possibly involve the extension of the breakwater, nothing more was done during the year 1896-97, except the completion of the break at the shore end, than appeared requisite to protect the unfinished superstructure just begun, and to preserve the lighthouse.

To this end, 15 blocks of concrete, forming aprons, were laid in position at the outer end of the work between October, 1896 and June, 1897. A quantity of stone, which had been swept around the point of the breakwater from the seaward to the harbour side, was also replaced in position. Some of this stone was laid outside the heavy footing blocks built in the previous year, and some was applied to restoration of the crest of the work at the back of the lighthouse. Breaches carried below the level of high water had been made by the sea at 5 or 6 points in the rubble mound between the lighthouse and the shore. An illustration of the violence of the seas which assail Negro Point breakwater is afforded by the removal of a stone, which weighed 5 tons, a distance of 76 feet in one winter. A marine dynamometer, secured to the masonry of the lighthouse, records the wave force at 4,000 pounds and upwards per square foot.

In order to retain, for natural protection, along the seaward face of the work, the littoral drift formerly swept by the waves over the top into the harbour, a break of piles, brush, stone and timber, 279 feet long, 8 feet wide and 4 feet high, begun in 1895, was completed in 1896-97, and was also extended 140 feet along the timber work that year with good effect. As a result of the construction of the break the foreshore has advanced seaward, while the beach has increased in height and breadth.

Besides the general accretion of the beach, a tongue of drift, observed after the erection of the break to be near the shore, has at the foot of the talus on the seaward side travelled 200 yards or more towards the outer end of the breakwater.

The formation of this spit, generally 10 feet wide and 2 feet high against the work, indicates that the drifting sand, gravel, shingle, &c., which formerly went over the breakwater into the harbour will in time afford important natural protection to the work, and will reduce the length of the face to be maintained.

During the year 1897-8, as a measure of protection, 152 yards of granite were obtained and deposited about the lighthouse for protection during the winter, while stones previously removed by the sea were replaced in position.

The advance of the foreshore rendered necessary in that year the enlargement of the timber break, which was extended a distance of 80 feet along the breakwater.

A small groyne was also built for the purpose of obtaining some information as to the quantity of the littoral drift near the shore end. To preserve the timber, the top of the piles and the knees of the break were given two coats of pitch.

One thousand and nineteen cubic yards of granite were supplied and laid in place in 1898-9; while 285 yards of the original stone of the work, displaced by the sea, were restored to position.

During 1899-1900 414 cubic yards of granite were delivered and placed round the lighthouse; 606 cubic yards of dislodged stone were put back; 5 concrete blocks, containing 52.1 cubic yards, were also laid in place.

In 1900-1 five blocks of concrete, aggregating 54½ cubic yards, were built *in situ*. 1,313 cubic yards of new granite were received and placed, while 1,893 cubic yards of the original stone of the breakwater, removed by the sea (which on November 8, 1900, made two clear breaches through the work), were restored to position. The timber break was also extended two tiers for a distance of 40 feet.



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During the year 1901-2 4,694 cubic yards of large stone, principally granite, together with 719 cubic yards of small stone, were delivered and placed in position. A number of large stones of the original work, amounting to 1,713 cubic yards, which had been dislodged by the sea, were restored to place by means of a floating steam derrick. Repairs were also made to the derrick and buildings.

During the fiscal year 1902-3 4,603 cubic yards of large and 600 cubic yards of small stone were delivered and placed at Negro Point breakwater. This material was chiefly applied to restoring the point of the breakwater to the original length—that is, by extending it 50 feet beyond the lighthouse. Although the stones were of large size, averaging a little less than  $1\frac{1}{2}$  cubic yards (while some attained the bulk of 5, 6 and even 7 cubic yards each), a part of the restored point was swept away by the heavy storms of the winter. Besides the new material added to the work, 2,201 cubic yards of the original stone of the breakwater which had been dislodged by the sea, were, by standing or floating derricks, shifted and replaced either on the point of the breakwater or in the gaps made in the crest. The covering of the cribwork was also patched in places, the plant overhauled, and a derrick for hoisting boats erected near the shore end.

Until the work has either been extended to Partridge Island or has received a permanent superstructure, constant repairs will be required.

The total expenditure on Negro Point to June 30, 1902, amounted to \$495,259.82.

The expenditure for the fiscal year 1902-3 amounted to \$18,027.93.

## NEGUAC.

Neguac, Northumberland county, is situated on the eastern side of the inner Miramichi bay, 27 miles north-east of Chatham and 22 miles south of Tracadie.

Between 1892 and 1894 the department constructed at Neguac a wharf 1,180 feet long, with a depth, at the outer end, of  $5\frac{1}{2}$  to 6 feet at low water. It consisted of an approach of earth and gravel, with sides of dry masonry, 80 feet long and 20 feet wide on top, a shore block 290 feet long and 21 feet wide, 19 blocks 20 by 21 feet, a pier head 40 by 62 feet, and 20 intervening spans or openings of 20 feet each. The approach and blocks were built of round-timber open cribwork, filled with stone ballast, the openings were spanned by 10 by 12-inch stringers, and the whole top covered with 4-inch plank.

Spring tides rise 5 feet.

In consequence of the decayed condition of the top of the wharf and damage caused by a high tide accompanied by a heavy storm during the fall of 1901, repairs became necessary, and an appropriation for that purpose was voted by Parliament in 1902 for expenditure during the fiscal year 1902-3.

The work performed during the year 1902-3 consisted in removing all the caps and covering of the work excepting that on the pier head. New 10 by 12-inch stringers, 6 in the width of the work, were then laid over the old ones from the inner end of the shore block out to the inner face of the pier head, in order to raise the work 1 foot, it having been found to be too low. Depths generally of 2 feet of stone, or a total of 503 cubic yards of stone ballast, were placed in all the blocks. New 4-inch covering was laid over the whole of the work, and 6 by 8-inch spruce caps, along both sides, and 10 by 12 caps around the pier head, were placed. Six hardwood fenders, 10 by 12 inches, were placed on the pier head, also 6 on each of the three outer blocks. The timbers of the truss were all renewed, and the tops of the two blocks, which had parted at and been forced up from low water, were replaced and secured with hook-shaped iron rods, hooked under the timbers below low water, and bolted to those above. A 4-inch plank, 6 inches wide, was placed on chocks midway on the top of the wharf for its full length, to avoid confining the traffic to the centre. The tops of all fenders, caps and the truss work were given two coats of carbolineum. Eight ring-bolts were distributed along the sides of the wharf for a distance of 83 feet from the inner end of the covering of



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the wharf; the approach was rebuilt, the sides consisting of stone embankments and the interior of gravel and earth.

The expenditure during the fiscal year amounted to \$4,419.06.

#### PARTRIDGE ISLAND.

Partridge Island, St. John county, is a rocky eminence standing at the mouth of St. John harbour, and dividing the entrance into east and west channels. The island is devoted to quarantine and lighthouse purposes.

At the northern end of Partridge Island, two narrow piers of cribwork, built many years ago, give shelter to the boat landing at the station. Between them a substantial block of new cribwork, 50 feet long and 22 feet wide, begun and nearly finished in 1896-97 as a foundation for the disinfecting house, was completed in the succeeding year. A boat slip intended for use at low stages of the tide, was partially built, a new mooring post put in, and minor repairs to the end of the west pier were made at the same time.

In the fiscal year 1902-03 the west pier of Partridge Island, 121 feet long and 17 feet wide, was raised by the addition of one tier of cross ties, new stringers, covering and cap. A house, 14 by 24 feet, was built for the boat of the medical officer, and a new derrick (excepting the mast) was made for the purpose of landing and launching the boat, the weather being too rough in the winter to allow it to lie afloat.

From the east pier, 110 feet long, 20 feet wide, 11 fenders were removed and were replaced by new ones. The break was strengthened by the addition of 7 new knees, the boat shed was shifted, the derrick rebuilt and a new cap laid. The top was also covered throughout with two thicknesses of 2-inch plank.

The total expenditure to June 30, 1902, amounted to \$5,475.18.

The expenditure during the fiscal year 1902-03 was \$1,302.01.

#### POINT DU CHENE.

Point du Chêne, Westmoreland county, lies on the western side of Northumberland strait and on the south-east side of the entrance to Shediac harbour. It is the terminus of a branch line of the Intercolonial Railway and a point of steam communication with Prince Edward Island.

The works at Point du Chêne consist of an inner and outer breakwater, each 600 feet long, with an opening of 80 feet between them, and a ballast wharf (so called), 200 feet long, connecting the outer breakwater with the Intercolonial railway wharf.

During the fiscal year 1902-03 repairs were made to the outer breakwater, as follows: 6 pieces of loose boiler plate at the foot of sloping face were removed and face timbers for a length of 50 feet were inserted. The 6 pieces of boiler plate removed were replaced, also three new ones in place of that number lost. Two fender piles were driven on the outer face and three pieces of sheathing of sloping face were renewed. Chocks were inserted at the back of the 12 fender piles that had been forced outward. The tops of the fenders that projected above the face of the work were cut off level with the top of the face timbers, and the covering and stringers, on a length of about 50 feet of the work damaged by storm during the fall of 1902, were removed and piled up at the back of the work.

The expenditure for the fiscal year 1902-03 amounted to \$499.50. The total expenditure to June 30, 1903, was \$81,194.81.

#### QUACO.

Quaco, St. John county, is on the northern coast of the Bay of Fundy, about 30 miles to the north-eastward of the entrance to St. John harbour. The bay is semi-circular, and lies open to the south-east between Quaco Head and Macomber Point,



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some two miles apart, the breadth from a straight line drawn between these capes being about a mile. At the mouth of a small river discharging into the eastern end of the bay, a small harbour of refuge has been formed by the construction of two piers, the eastern work 310 feet, and the western 302 feet long. The harbour is dry at low water, and is only accessible for about six hours during each tide to the coasting vessels which come to load timber or to seek shelter. Spring tides rise 30 feet; neaps, 23 feet.

In 1896-97 repairs were made to the west pier for a distance of 149 feet, the sheathing of the sloping face and several face timbers being renewed with birch 14 inches square secured with screw bolts, a quantity of ballast being replaced. A couple of fenders and a ladder were also added. At the same time, the east pier was protected from the scour of the stream from brush and stone, 13 new fenders were applied, and the decayed tops of five others were replaced by sound material; small repairs were also made to the covering and sheathing, and another ladder was provided. The whole expenditure in that year amounted to \$1,377.51.

In 1897-98 a sum of \$50 was applied to closing a small opening and strapping the angle of the west pier, which had been struck by a schooner.

In the fiscal year 1902-03 the sloping face of the east pier was reconstructed for a length of 70 feet, the outer end being 10 tiers in height, and the inner end 7 tiers high.

The total expenditure up to June 30, 1902, amounted to \$38,321.32.

The expenditure during the fiscal year 1902-03 was \$673.34.

## RICHIBUCTO.

Richibucto, Kent county, lies on the eastern side of Northumberland strait, about midway between the entrances to the Miramichi bay and Shediac harbour. It is the shire town of the county, a deal port, and a terminus of the Kent Northern Railway.

The entrance to the harbour is between two sandy beaches known as 'North' and 'South.' The works originally proposed for the improvement of the harbour were two breakwaters, one to extend from the southern point of the north beach 1,200 feet, and the other to run in a north-easterly direction from the south beach, the object being to confine the water to one permanent channel and so scour the bar at the entrance.

In February, 1873, the north pier was constructed for a distance of 1,200 feet. In 1876 it was found that the sea, during easterly storms, followed the inside of the breakwater, whirled around the upper end and endangered the beach. From 1880 to 1882 protection works were extended westward along the face of the beach to prevent erosion. Extensions in the same direction were continued during the years 1888, 1889, 1890 and 1891, for lengths of 200 feet, 300 feet, 94 feet and 140 feet respectively, making the works a total length of 2,158 feet, composed principally of brush, stone and piling.

Repairs to the inner part of the eastern section were undertaken during the year 1898-99, and at the end of June a section of 238 feet in length was nearly reconstructed, and another 593 feet partly repaired and raised 3 feet.

In 1899-1900 the work commenced during the previous year was completed. Off the harbour face a pile, brush and stone groyne 33 feet long and 15 feet wide was constructed, and another of the same length rebuilt. Off the inner face two brush groynes each 191 feet in length were built, and off the northern face of the breakwater, near the outer end, a new breastwork 470 feet long and  $8\frac{1}{2}$  feet wide, consisting of pile framework, sheathed on the outside and filled with brush and stone, was constructed.

In 1900-1 a steam derrick was built for pile-driving and handling large stone, three additional stake and brush groynes, aggregating 262 lineal feet, were built off the inner face of the eastern section, and a protection, 26 feet wide and variable in height, consisting of mattresses (formed of fascines and evergreen brush) pierced with piles and weighted with stone, was commenced on the harbour side of the outer section, 1,180 feet inward of the outward end and partially built outward for a distance of 432 feet.



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In 1901-02 work was resumed in August with a view to continuing the protection work of the previous year a total distance of 866 feet, or out to within 300 feet of the outer end, and from the latter point, building an extension 315 feet long running in a south-easterly direction. One hundred and thirty feet of the extension were partly built, and then, owing to difficulty in procuring materials, work was closed down at the end of September. Plans were prepared and tenders called for, for the completion of the work.

The protection work is to be similar to that commenced during the previous year, while the extension is to consist of brush mattresses placed on the bottom, weighted with small stone, pierced by three rows of piles, driven 5 feet apart longitudinally and 4 feet transversely, and finished with large stone, forming a top 12 feet wide and sides sloping 2 to 1.

In February, 1902, a contract was entered into for the completion of the unfinished extension and protection as above. Work was commenced in the latter part of May, and at the close of the year four mattresses, 60 by 26 feet, had been placed for the protection work. Twenty piles were driven in the extension and 285 cubic yards of stone were delivered and placed in the work.

During the year 1902-3 the contract work was continued, and at the close of the year had been completed with the exception of delivering and placing about 855 cubic yards of slope and 350 cubic yards of core stone, adjusting some portions of the laid slope and filling in voids between the large stones.

Slight repairs were also carried on during the year by day labour, viz.:—Protecting with brush and stone three sections at the back of the old work (immediately to the westward of that under contract) from undermining, the first section 50 feet long and 7 feet wide, the second 60 by 5 feet, and the third 70 by 3 feet. A quantity of stone left piled on one of the sections of the work was evenly distributed over a length of 600 feet, and the tops of 150 piles and portion of the break timbers were given a coating of tar.

The expenditure during the fiscal year 1902-3 amounted to \$16,555.25.

The total expenditure to June 30, 1903, was \$116,724.47.

#### RIVER ST. JOHN AND TRIBUTARIES.

The river St. John proper, 450 miles long, takes its rise from sources in the province of Quebec and state of Maine, at a reputed maximum altitude of 2,159 feet above sea level. Entering New Brunswick at the confluence of the St. Francis, a little below the borders of Quebec, it continues to be the international boundary almost to Grand Falls, and after flowing through the province for nearly 300 miles (by way of the counties of Madawaska, Victoria, Carleton, York, Sunbury, King's and Queen's) discharges into the Bay of Fundy at St. John. Many tributaries, some being of considerable magnitude, are received by the main stream. Among them are St. Francis, Madawaska, Green river, Grand river, Salmon river, Aroostock, Tobique, Presqu'Isle, Maduxnakeag, Eel river, Nakawick, Nashwaak, Oromocto, Jamseg (Grand lake), Washademoak, Belleisle and Kennebecasis. Except the last five, which are slightly tidal for some distance, they are fresh water streams.

The total basin from source to mouth is computed to be 26,000 square miles, and is almost equal to the whole of New Brunswick; but as part of the watershed lies outside only a little more than one-half the province is drained by the river. The St. John is considered navigable for vessels 15 feet in draught for a distance of more than 50 miles from the mouth, but no positive information on this point has yet been obtained. About 8 feet at low water can be carried to Fredericton, 84 miles from the sea, and 6 miles below the head of tide at Springhill. Three natural features of the river are remarkable, viz.: the tidal falls, grand falls, and the annual floods.

Although in summer the fresh water stream between Woodstock and Fredericton is in places 400 to 1,000 feet wide, expanding at the latter place after reaching the



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tide level to half a mile in breadth, yet the actual mouth of the river, a rocky gorge 400 yards long, immediately at the head of St. John harbour, measures but as many feet across at high water. Here at low water at the level of the river is from 11 to 15 feet above the sea, and as the ordinary tides flow from 23 to 27 feet, the sea level at high water is from 8 to 13 feet higher than the waters of the river. Thus there are two falls at every tide, viz.: one outward and one inward, and vessels can only pass when the waters of the ocean and river are on a level. This occurs only for a space of 10 minutes during each ebb and flow of the tide; at all other times it is either impassable or extremely dangerous. (Admiralty sailing directions.)

At Grand Falls, 223 miles from the sea, the whole volume of the river plunges over an almost perpendicular face of limestone, 60 feet high, into a deep ravine 250 feet across, somewhat similar to the narrow pass at St. John. Flanked for nearly a mile by lofty rugged cliffs, the confined current dashes from the foot of the falls with excessive strength, mining deep pot holes in the rocky bottom of the channel in the course of a further descent, estimated to be slightly less than the first. In the harbour of St. John, ordinary spring tides are considered to rise  $25\frac{1}{2}$  feet. At the wharfs of the river steamers, a mile above the falls while summer range is but 3 feet, the highest flood mark is given as 17 feet above extreme low water. At Oromocto, 73 miles from the sea, where the tidal range is from 10 to 12 inches, the flood of 1887 reached a bridge 20 feet above low water. At Andover, 200 miles from the sea, floods attain an elevation of more than 27 feet above summer level. By contrast, the Tobique and St. Francis swell 9 and 6 feet respectively. After the first spate, due to the melting of snow in the catchment basins of the Kennebecasis, Belleisle bay and Washademoak, a secondary flood occurs, caused by the back water of the main river, which is fed from sources farther north, and consequently later in thawing.

The harbour of St. John is open all the year round, but the river is ice bound from November to April, an average period of 144 days.

The water usually begins to rise in April, reaching flood pitch early in May, and maintaining a high level for two or three weeks. The ice run takes place before the time of highest water. By the middle or end of July, the water has fallen to summer level, a stage lasting, with some variations dependent upon the rain fall, for about 60 or 70 days.

In addition to a little coal, a considerable quantity of cordwood, and the ordinary food supplies yielded by the farms of a lengthy fertile valley, the trade of the river comprehends an abundance of valuable timber, fluctuating each season in amount, but generally at least equal to 135 million superficial feet annually. Most of the logs are floated loose down the tributaries and upper river to Fredericton, some being manufactured there and shipped coastwise or to the United States. The remainder, or major part, is towed from the provincial capital to St. John in rafts, giving employment to a fleet of tugs.

For the purpose of works, three divisions may be made of the river.

1. Tidal navigation, for steamers and sailing vessels between St John and Fredericton, 84 miles, requiring 11 feet at low water. Principal obstructions: the Oromocto shoals, about  $1\frac{1}{2}$  miles; the middle ground above Oromocto island, about 1 mile, and the shoals abreast Fredericton, rather more than  $\frac{1}{2}$  mile in length. The last are now dredged, but the other obstacles remain.

2. Inland navigation, from Fredericton to Woodstock, a distance of about 65 miles, requiring about  $3\frac{1}{2}$  feet at low water. The obstacle to inland navigation, besides boulders in some places and perhaps bed rock at Meductic, are shoals of material more or less coarse, according to the strength of the current, varying in composition from sandy gravel to stones. The chief bars are at Springhill and Bear Island; while Knapp's, Perley's, Coac, Nackawick, Belvisor, Moore's, Bett's, Dibblee's and Bedell's bars, with Meductic rapids, constitute according to present information lesser obstructions. Dividing above Springhill into two main channels, and from a general width of 350 yards opening to a stretch of  $1\frac{1}{2}$  miles between banks, with a water increased by







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*Green river (Madawaska county).*—From the channel at First Falls, Lake Branch, Green river, 31 miles from the mouth, 111 cubic yards of rock were removed by blasting. Tow paths were also cut on the main stream round the large eddies between Big Forks and Little Forks, 10 miles apart. The tow paths aggregated 765 feet in length, and were 15 feet wide. The expenditure during the fiscal year 1902-03 was \$200.

At Second Falls, Green river, 15 miles from the mouth, 10 boulders equal to 89 cubic yards of rock, were blasted during the fiscal year, at an expenditure of \$87.09.

*Iroquois river (Madawaska county).*—Just before the end of the fiscal year, the work of building a dam and a sluice on the Iroquois river had been commenced. The expenditure during the fiscal year 1902-03 amounted to \$24.25.

*St. Francis (Madawaska county).*—On the St. Francis, 6 yards of rock were blasted at Cross Lake rapids, 11 miles from the mouth, and the channel was cleared. From McDonald's Rocks, 3 miles from the mouth, 95 cubic yards of rock were removed by blasting. The expenditure amounted to \$200.

Exclusive of the cost of dredging, the total expenditure on the River St. John and tributaries to June 30, 1902, amounted to \$143,988.53.

The whole expenditure for the fiscal year 1902-03, including \$760.49 for the foreman of the Upper river, has been \$8,556.81.

## SHIPPEGAN GULLY.

Shippegan Gully, Gloucester county, a passage between Shippegan Island and the mainland, is situated on the western side of the Gulf of St. Lawrence, and is distant 3 miles south-east of Shippegan village, the terminus of the Caraquet railway and 65 miles east of Bathurst, the shire town of the county.

With a view of improving the entrance to the harbour, the department in 1875 commenced the construction of a breakwater on the eastern side of the gully and a dam 890 feet long to close what is known as the eastern gully, distant three-fifths of a mile eastward of the main gully.

From 1875 to 1890 the works were confined to the eastern side of the entrance, and at the latter date consisted principally of a pier or breakwater at the point, and a breastwork along the northern face of the beach, the whole having a length of 1,220 feet, one-third of which was constructed of cribwork and the remainder of brush and pile works.

In 1880-81 and in 1883 the dam was repaired, raised and strengthened, and during the latter year the pier was also repaired and extended 120 feet.

General repairs were again made during 1883-84 and 1886-87. In 1888-89 the work was further extended 50 feet by the construction of an additional block at the outer end.

During 1890-92 a contract was entered into for the construction of a breakwater 1,194 feet long off from the western beach, consisting of a pilework, brush and stone, and the reconstruction of 137 feet of the outer portion of the eastern work.

In 1892-93 and 1893-94 repairs were continued, and in 1897-98 plans were prepared and general repairs to all the works undertaken. These were continued until the winter of the following year, during which time the dam was raised 3 feet over a distance of 452 feet and extended westerly 185 feet. An apron of brush and stone 375 feet long was also built on the south side of the dam, and on the northern side 10 rows of stakes or hand piles were driven forming groynes for the purpose of arresting the drift of seaweed and sand, thus stopping the leaks, and at the same time protecting and strengthening the dam. Between the dam and Fruing & Co.'s fishing establishment, 4 hurdles 155 feet in total length, 2 pieces of brush, stake and gravel work, one 12 by 60 by 3 feet, and the other 13 by 46 by 4 feet, were constructed in order to preserve the beaches and confine the team traffic to one course. Immediately to the east of Fruing & Co.'s establishment, a pile bent structure, 120 feet long, filled in with brush and stone, and a further length of 119 feet of brush and stone alone was built to close an opening in the harbour side of the beach. Near the inner end of the east pier, 63 feet



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of pile bent work was constructed and between this work and the pier head, one breach of 22 feet, one of 62 feet and another of 70 feet were closed with pilework filled in with brush and stone. A gap of 90 feet in the pier head was closed by the partial construction of a close-faced cribwork block and a pile structure, each 45 feet in length, and other minor repairs were made. On the west side of the gully, 62 piles were driven at the outer end of the breakwater and 180 feet refilled with brush and stone. Along the west beach, a breastwork 1,669 feet long of stakes, piles, brush and gravel, was constructed to close runnels and raise the crest of the beach, and an opening of 43 feet between sand dunes was closed with stakes, brush and gravel.

During 1899-1900 the gap of 90 feet in the east work was completed. 455 feet were reconstructed with fascines, brush and stones. One pile groyne, 26 feet long, was built on the harbour side of the work, and another, 220 feet long, on the seaward side with stakes, brush and gravel. The dam was raised 3 feet with brush and stone for a distance of 495 feet. An apron 476 feet long and 8 feet wide was placed along the southern side, and an extension of 17 feet was made to the eastern end, from which latter point, a groyne, 180 feet long, of stakes, brush and stone, was constructed nearly at right angles to the dam.

In 1900-01 a new pile pier head, 44 by 34 feet, was built at the outer end of the eastern work, and breastworks, 200 feet and 92 feet long respectively, were built on the outer and inner sides of the breastwork built the previous year on the west beach. 190 feet of the west breakwater was sheathed horizontally on the harbour side between high and low water, the interior of the work was strengthened by braces and an extension of 100 feet was made to the inner end.

During 1901-02, on the east side, the outer block of the breakwater was ballasted, one pile groyne 48 feet long was constructed and another partially so. The work to the east of Fruing & Co.'s was sheathed with 3-inch deals, and between this and the dam, a distance of 1,826 feet, a beach protection work was built. The dam was also raised  $3\frac{1}{2}$  feet, over a distance of 350 feet. On the west side, the outer 130 feet of the breakwater was strengthened with braces, piles were driven at its outer end, horizontal sheathing was placed for a further distance of 130 feet on the eastern side of same, and the outer 30 feet was partially filled with brush and stone. Also on the harbour side of the breakwater, a groyne 48 feet long was constructed and piles were driven to increase the length to 88 feet, and an extension of 175 feet was made to the inner end by driving close piles backed with brush and stone.

During the fiscal year 1902-03 the work to the east of Fruing & Co.'s was extended westerly 121 feet to stop erosion of the beach. This consisted of 163 piles driven close, 25 piles driven 6 feet apart and 8 feet back of the close piles, and the space between filled with brush and stone for a height of from 4 to 6 feet. Two new groynes, each 40 feet long, made of plies driven 4 feet apart, and faced with 9-inch hardwood timbers, were built on the north side of the eastern work at distances of 350 and 500 feet from the outer end. Two groynes on the east side were increased in height by placing and securing two additional tiers of 9 by 9-inch hardwood timbers. The western breastwork was extended westerly 1,200 feet, the work consisting of 4 to 6-inch stakes driven 4 feet apart longitudinally and transversely, and filled with brush and weighted with gravel. The horizontal sheathing on the eastern side of the west breakwater was re-bolted, 25 pieces of covering were renewed and 2 iron straps were placed around the outer corner.

The expenditure for the year 1902-03 amounted to \$1,999.76.

The total expenditure to June 30, 1903, was \$86,956.44.

#### ST. ANDREW'S.

St. Andrew's, the county town of Charlotte, lies by water 50 miles west of St. John. The site of the town was part of the seigniory of Passamaquoddy granted to St. Aubin in 1684. It was settled by the loyalists a hundred years later, and was for some



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years a place of consideration, a military post, a fishing station, and a port of direct trade with the West Indies. The town, situated at the mouth of the St. Croix, on a point of a peninsula stretching into Passamaquoddy bay, is well laid out, and has a population of about 1,200. In the summer season St. Andrew's is a favourite watering place, much frequented by American visitors.

The harbour, sheltered by Navy island a mile in length, affords about 8 feet at low water, or 33 feet at high water ordinary spring tides. Repairs to the public wharf, an old structure of round-timber cribwork, 489 feet in length, built many years ago, were begun by the department in the spring of 1902.

By the end of that fiscal year 16 bents (a distance of 142 feet) of the new work had been erected; ballast poles and guard timbers had been laid for 128 feet, and the top had been ballasted for 90 feet.

During 1902-3 the repairs were extended to 322 feet in total length, and were completed. The work is 18 feet in width. The top, of new stringers, ballast poles, ballast and gravelling, is carried on trestle bents between the timbers of the old work. At the extremity of the work repaired, a turning place, 40 feet long and 23 feet wide, also supported on trestle bents, was made for teams.

The total expenditure up to June 30, 1902, amounted to \$3,835.16.

The expenditure during the fiscal year 1902-3 was \$799.62.

## ST. GEORGE.

St. George, Charlotte county, formerly called Magaguadavic, a small but flourishing town containing with the parish about 3,000 inhabitants, and situated at the head of tide water on the river of that name, is chiefly noted for lumbering and for the monumental works established there to manufacture the red granite of the neighbourhood. On account of the fine water-power due to the great fall, immediately at the village, from fresh to tidal water, a pulp mill has been erected.

A public wharf, built by the county in tidal water, was partially repaired during the year 1901-2 by the department. This old wharf of round-timber cribwork, 127 feet long and 39 feet wide, stands at the head in 24 feet at high water ordinary spring tides. The repairs consisted in rebuilding and raising the principal part of the wing of the wharf, 43 feet long and 20 feet wide, and in repairing the approach, 26½ feet long and 38 feet wide.

The approach to this wharf, 36 feet in width, which had been scoured by heavy rainfall, was repaired for a length of 25 feet, being filled in solidly to a depth of 6 feet. Two guard timbers were also placed on the lower side of the wharf, at an expenditure of \$75.

Red Store wharf, 4 miles below St. George, is an old structure of round cribwork, 102 feet long, consisting of a pier head 39 by 21½ feet, standing in 13 feet at high water, and reached by an approach of two blocks and one span 25 feet wide. Four tiers of the pier head were rebuilt, a new ballast floor was laid and covered with about a foot of ballast. One new tier of longitudinals and two of cross ties were laid in the other blocks; 29 new fenders were placed in position, and new stringers, covering and cap were laid. The approach was also made up with brush and stone, the expenditure being \$700.

The total expenditure up to June 30, 1902, amounted to \$499.92.

The expenditure on both wharfs during the fiscal year 1902-3 was \$775.

## ST. LOUIS.

St. Louis, Kent county, is situated on the south side of the Kouchibouquac river, about 5 miles north-west of Richibucto, the shire town of the county.

To provide wharf accommodation, the department in 1888 constructed a work 206 feet long and 30 feet wide on top, on the south side of the public highway bridge at



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St. Louis. It is built of round-timber open cribwork, with top planking, and has a depth of 7 feet at low water along its outer face.

In 1900-1, owing to decay, the cap, covering and fenders were removed, the top was filled in with brush and stone, finished with gravel, and a new cap placed.

The repairs undertaken in 1900-1, not having been completed, and settlement of the filling having taken place, work was again carried on during the fiscal year 1902-3, the following repairs being made:—Two tiers of timber, one 10 by 12 inches and the other 8 by 10 inches, were placed along the inner faces and lower end; fenders were secured on both sides and end, which were sheathed between the fenders with 3-inch deal from the top to below the level of low water. A layer of sand and gravel,  $1\frac{1}{2}$  to 2 feet in thickness, was deposited on the top of the wharf, and the tops of the fenders and sheathing were given a coating of tar.

The expenditure during the fiscal year 1902-3 amounted to \$417.83.

The total expenditure to June 30, 1903, was \$3,087.94.

#### ST. MARY'S.

St. Mary's, Kent county, is situated on the Buctouche river, 7 miles above the village of Buctouche.

In 1884 the department constructed a wharf 125 feet long, 18 to 37 feet wide, adjoining the public highway bridge. It is constructed of open cribwork of round timber, with its outer face in 7 feet at low water.

Spring tides rise  $3\frac{1}{2}$  feet.

Repairs were executed during 1901-02, consisting in the removal of the top and reconstructing the same, the timbers having been found to be in a worse state of decay than anticipated, the appropriation voted for that year was not sufficient to complete the repairs.

During the fiscal year 1902-03 the repairs commenced during the previous year were completed, 16 pieces of new ballast flooring, 20 to 22 feet long, were inserted in the work; 126 cubic yards of stone ballast were deposited over different parts of the wharf; 14 timbers were placed between the face timbers of the channel side of the work to prevent the ballast washing out; 10 fenders, 10 feet long, and a ladder were secured on the outer end, and 6 fenders on the inner face. A hand rail was built along both sides of the inner 30 feet of the wharf and the tops of the fenders, and mooring posts were given a coating of tar.

The expenditure during the year amounted to \$198.96.

The total expenditure to June 30, 1903, was \$2,311.20.

#### UPPER SALMON RIVER.

Upper Salmon river, otherwise called Alma, the terminus of the Alberta Southern railway, is situated in the county of Alberta, 5 miles from Rocher Bay, and two miles from Herring Cove. From Alma, deals are either sent in coasting vessels to St. John for transshipment, or are transported directly to sea going vessels lying at the anchorage off Grindstone island, or in the roadstead of Herring Cove. For protection of the coasters lying inside the river mouth at the private wharfs which affords four or five berths, the department built in 1883 and 1884 a breakwater 26 feet in mean width, and 180 feet long. In 1886-87 this breakwater was extended to a total length of 420 feet. By position the work lies across the path of the littoral drift. In consequence, the foreshore has advanced nearly 500 feet on the weather side, and the drift having fully charged the outside of the breakwater, is now working round the end. Accordingly inside the point of the breakwater a bar 11 feet in height was formed which extended nearly across the mouth of the river. By means of a temporary groyne, inducing scour, the channel, which had become contracted to a width of only 34 feet, was increasing



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during the months of April and May, 1900, to 125 feet in breadth, but the shoal was soon formed again.

On August 6, 1902, a contract was let for the construction of an extension of the breakwater. By the end of the year, the excavation for the foundation had been made and the timber work begun.

The total expenditure to June 30, 1902, amounted to \$10,982.20.

The expenditure during the fiscal year 1902-02 was \$555.43.

## WILSON'S BEACH.

At Wilson's Beach, Charlotte county, a fishing settlement in a slight indentation of the coast on the west side of Campobello, an island in the Bay of Fundy, forming part of the county of Charlotte, a breakwater 375 feet in length, was built to shelter the cove by the joint contributions of the federal and local governments between the years 1874 and 1878. The outer arm of the breakwater having become dilapidated, and the cove having silted up, preparations were made in 1899-1900 to restore the inner end 248 feet in length, and the repairs were nearly completed in the following year, 1900-01. A quantity of material was also procured for the construction in deeper water of the dismantled outer end.

In 1901-02 the repairs to the inner end were completed. Crib No. 1 of the part to be reconstructed, 80 feet in mean length and 36 feet wide, consisting principally of hardwood timber, was built, placed in position and ballasted. Crib No. 2, 74 by 40 feet, made of similar material, was also begun, and at the end of June had been built to a height of 8 tiers. A quantity of timber was also delivered.

In the fiscal year 1902-3, crib No. 1 was increased to 130 feet in length on the outside and raised at the inner end to the 26th and at the outer to the 23rd tier. Crib No. 2 was brought up to the 23rd tier.

The total expenditure to June 30, 1903, amounted to \$26,678.69.

The expenditure during the fiscal year 1902-03 was \$4,004.84.

## PROVINCE OF QUEBEC.

## AMHERST.

Amherst village is situated at the eastern end of Amherst island, one of the Magdalen islands in the Gulf of St. Lawrence, which forms part of the electoral district of Gaspé.

Amherst is a port of considerable importance. Two steamers, plying between Pictou, Souris and Magdalen islands, call twice every week at Amherst.

The landing pier commenced at Point Shea in May, 1900, and built on a length of 188 feet during the fiscal year 1901-2, was extended during the last fiscal year 250 feet, making it, together with the 50 feet built from the outside face of roadway to side of cliff, a total length of 488 feet, with an average width of  $26\frac{1}{2}$  feet and an average height of 23 feet, giving 17 feet of water at the outer end at low water spring tides.

The top of the work stands now 5 feet above low-water level, and four tiers of 12 by 12 timbers will bring it to coping or floor level. The cribwork substructure settled from 4 to 6 feet in sand and clay. On the outer or easterly side a quantity of ballast stones had to be placed so as to prevent the undertow from undermining the work on that side.

The approach, 530 feet in length, built in May and June, 1901, being altogether too low and narrow, and a portion having been carried away, some temporary repairs had to be made on it, materials were bought and prepared to rebuild it in a more substantial way.

Four large scows for transporting ballast were built in the spring.

The amount charged to this fiscal year appropriation is \$11,798.23.

Spring tides rise 4 feet; neap tides 2 feet.



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## ANSE À BEAUFILS.

Anse à Beaufils, in the municipality of Cape Cove, County of Gaspé, is situated on the Gulf of St. Lawrence, 6 miles south of Percé.

In the years 1898 to 1901, protection works on each side of the channel leading to the inner basin were built, consisting of two training piers, each about 440 feet long.

During the fiscal year 1902-3, the pier on the east side having settled in the sand 6 to 8 feet deep, the sum of \$467.12 was expended in partly levelling the depressed portion.

The work was done by day labour.

## ANSE ST. JEAN.

Anse St. Jean is situated on the south shore of River Saguenay, 25 miles above its mouth.

A public landing pier, 366 feet in length, having a depth of  $7\frac{1}{2}$  feet of water at its outer end, was built at this place, by the local government in 1876, and continued by the federal government in 1879-80-1880-81.

During the fiscal year 1902-3 the work done consisted of general repairs to the flooring, a new movable slip, sheathing and repairs to the shed.

Spring tides rise 17 feet; neap 10 feet.

The work was done by day labour at a cost of \$657.91.

## BAIE ST. PAUL.

The village of Baie St. Paul, in the County of Charlevoix, with a population of about 1,400, is situated on the north shore of the St. Lawrence, 60 miles below Quebec. It is built on either side of the River Du Gouffre, which empties into a bay one mile and a quarter deep, and three miles wide at its entrance. With the exception of some small channels the bay is dry at low tide. Spring tides rise 20 feet, neap tides 13 feet.

*Isolated Block.*—This block, built in 1874-5, is 200 feet long and 25 feet wide, with a head 60 feet long and 50 feet wide. It was built in 12 feet of water at low tide, on the west side of the bay, a distance of 3,000 feet from the shore at high tide and 600 feet at low tide. As the accommodation afforded to passengers and freight was so poor, it was decided to build a landing pier on the east side of the bay, at Cap aux Corbeaux, three miles from the village. The isolated block may become, in the near future, a subject of serious consideration as to whether it will be advisable to make very extensive repairs to it, or else to have it doomed to destruction.

The block is hardly safe for landing passengers. During the month of July, 1902, some repairs were done to the slip on the east side of the block, and broken face timbers have been renewed.

The expenditure was \$395.69.

*Cap aux Corbeaux.*—During the fall, 1902, minor repairs were done to the wharf, and in the spring of 1903 hard maple sheathing was renewed and small repairs done to the flooring. The work was performed by day labour.

This expenditure amounted to \$1,806.44.

The total expenditure for the fiscal year 1902-3 was \$2,202.13.

BERTHIER (*en haut*).

Berthier (*en haut*), in the county of the same name, is a town of 1,600 inhabitants, situated on the north shore of the St. Lawrence, 45 miles below Montreal, and opposite the town of Sorel.

*Construction.*—In order to protect the village and wharfs against the action of drift ice, the sum of \$2,000 was appropriated by parliament in 1886 for the construction



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of an ice pier which was completed in 1887, at a total cost of \$1,611.04. Being found too low, it was raised three feet in 1888 at a cost of \$99.97.

Sufficient protection was not, however, afforded by the work to prevent considerable damage being done by the ice during the spring floods of 1896. A new ice pier 25 by 30 feet high, was therefore, constructed in 1897 on the edge of the beach, at the upper end of the town, at a total cost of \$2,584.16. The piers have answered all expectations.

*Repairs.*—In 1892 minor repairs were effected to the ice pier built in 1887, at a cost of \$13.50. In 1897 attention was called to the fact that the only protection the lower part of the town had against ice shoves, was a low ice breaker at the head of the Richelieu and Ontario Navigation Company's wharf. The ice breaker being very much out of repair, and the formation of the shore such that the construction of a new pier in an equally good position would have been costly and an impediment to navigation, permission was obtained from the company to repair and increase the height of their work. This was done at a cost of \$733.29.

Minor repairs were effected in 1898 to the ice pier built in 1897 at a cost of \$8.50.

In 1903 the top of the ice pier built in 1887, being much rotten and dilapidated, was removed down to the low water level and rebuilt of the same form and size, but two feet higher than before. The work, carried out by day labour, was commenced in February, 1903, and completed in June of the same year, at the cost of \$1,354.32.

The total amount expended on this work is \$6,875.86, as follows:—

Construction. . . . .	\$4,295 17
Repairs. . . . .	755 29
Reconstruction. . . . .	1,825 40
Total. . . . .	<hr/> \$6,875 86

## BIC.

Bic, on the south shore of the St. Lawrence, in the county of Rimouski, about 170 miles below Quebec, is a favourite summer resort. It contains flour and saw mills, and cheese factories. Its harbour affords the best facilities of shelter for vessels of moderate draught.

Spring tides rise 16 feet, neap tides, 8½ feet.

During the fiscal year ended June 30, 1903, the addition to the wharf commenced in 1900, has been completed; two isolated piers, one 25 feet square, the other 22 by 23 feet, have been brought to the level of the old wharf, a height of 5 feet, and were connected together and to the rest of the structure with cedar stringers and a 3-inch spruce deal flooring. A spruce deal sheathing, 3 inches thick and 18 feet in height, has been placed all round the extension, forming a total length of 163 feet, the top flooring of the old wharf was also repaired.

The expenditure for the fiscal year 1902-3 was \$990.15.

## BOUCHERVILLE.

Boucherville, an incorporated village in Chambly county, is prettily situated on the south shore of the St. Lawrence and a station of the Montreal and Sorel railway, 9 miles from Montreal. It has a telephone office, a Roman Catholic church, one hotel, six stores, one grist mill, a large convent, and a commercial college.

During July and August, 1903, the sum of \$880.43 was expended for general repairs to the landing pier at this place. The two mooring posts were replaced with two cast iron nigger heads, a concrete flooring was built on the head block and approach, and the sheathing was repaired.



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## CACOUNA.

Cacouna, one of the best known and most frequented summer resorts in Canada, is an important village in the County of Témiscouata, on the south shore of the St. Lawrence, 120 miles below Quebec.

During the past fiscal year, in view of the construction of an additional block to complete the wharf begun some years ago, spruce timber, square and round, was bought for the sum of \$1,313.60, but owing to delay in the delivery of that timber the construction of the extension could not be commenced during the year.

Spring tides rise 20 feet; neap tides, 12 feet.

## CAP SANTÉ.

The village of Cap Santé, the chief town of the County of Portneuf, is situated on the north shore of the St. Lawrence, 5 miles below Portneuf, and 31 miles above Quebec.

Spring tides rise  $14\frac{1}{2}$  feet, neap tides  $8\frac{1}{2}$  feet.

The wharf at this place is built parallel with the shore, and has a landing face 118 feet long, accessible at half-tide by boats of light draught.

During the last fiscal year the sum of \$397.10 was expended in effecting sundry repairs to the wharf, which consisted principally in improving the top flooring.

## CARLETON.

Carleton is the most flourishing parish on the Baie des Chaleurs, in the County of Bonaventure, 12 miles by water from Dalhousie, N.B.

The village is on the shore of the Tracadigèche bay, at the foot of a mountain over 1,800 feet high, and is one of the most picturesque sites of the coast. It is already in great repute as a watering place.

The wharf at this place was built in 1882-3. It has a total length of 234 feet, including an outerblock of 39 by 39 feet, the shore end, on a length of 195 feet, is only 20 feet wide on top. The average depth of water at the outer end is 10 feet at low water spring tides.

During the last fiscal year the sum of \$500 was expended in renewing the whole of the flooring and cap pieces with 3-inch spruce planks and cedar timber. Some of the sheathing and fenders were also renewed or repaired.

## CROSS POINT.

Cross Point, County of Bonaventure, is situated on the north shore of the Restigouche river, about 15 miles from its entrance into Baie des Chaleurs, and opposite Campbellton, N.B.

On March 20, 1903, a contract was entered into with Messrs. Lachance & Co. for the construction of a wharf at this place. The structure has a total length of 455 feet, 20 feet wide, with the exception of the outer end, which is 35 feet wide for a length of 45 feet, where the landing slip is built.

The work consists of a stone approach or embankment 60 feet long, 20 feet wide on top, with sides and end sloping 1 in 1; of a cribwork abutment, 20 by 20 feet, two blocks or piers of cribwork, 20 by 20 feet, placed 20 feet from each other and from the abutment and outer block; and of an outer block 275 feet long. The spaces between the piers at the inner end are spanned with stringers; the whole wooden structure is covered with planks and built of close-faced cribwork, ballasted with stone. The outer end is 15 feet high above the bottom of the river, and the top stands 4 feet above high water spring tides, which here rise 11 feet.

The wharf is intended to be approached at high tide only; during low water spring tides its outer end is left dry.



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At the end of the fiscal year 1902-3 the work had been built to within 4 feet of the required height. It has since been entirely completed. The expenditure at the end of the fiscal year was \$4,999.47.

## CUISSSES D'ALMA.

Les Cuisses d'Alma, in the little discharge of Lake St. John, is in the parish of St. Joseph d'Alma, and 7 miles from the village of that name.

In the year 1901-2 work was commenced to blast the two rocks called 'Cuisses d'Alma,' in order to widen the channel of the 'Petite Décharge.' During the fiscal year 1902-3 this work was continued. The sum of \$1,229.27 was expended.

## FATHER POINT.

Father Point, in the County of Rimouski, is on the south shore of the St. Lawrence, 6 miles west of the village of Rimouski. On November 8, 1900, a contract was entered into with Messrs. Heney & Smith for the construction of a wharf 600 feet in length, by a width of 40 feet at the bottom and 32 feet at the top, with a depth of 16 feet at low water spring tides at the outer end.

The work was commenced in 1902 and pushed vigorously, but owing to difficulties of construction caused by the winds in this exposed locality, several delays occurred, and the work had not been completed at the end of the fiscal year 1902-3.

The expenditure for the year 1902-3 is \$22,355.85.

## GRANDES BERGERONNES.

Grandes Bergeronnes, in Saguenay county, is on the north shore of the St. Lawrence, 18 miles below Tadousac.

The removal of boulders, by blasting, from the mouth of the River Grandes Bergeronnes, was continued during the last fiscal year.

A channel, 150 feet wide, from the entrance of the river to the village, a distance of 1 mile, was completed.

The work was done by day labour, at a cost of \$398.77.

A block of cribwork, 20 by 30 feet, was commenced on the west side of the river, with an expenditure of \$239.30.

The total expenditure for the fiscal year was \$638.07.

Spring tides rise 16 feet, neap tides 9½ feet.

## GRAND ENTREE.

Grand Entree is situated on the western end of Coffin island, one of the Magdalen islands, in the County of Gaspé.

A block, 40 by 50 feet, was built inside of the harbour during the fiscal year 1900-01, and completed in 1901-2. The outside face and corners had to be reinforced both inside and outside, well braced and sheathed. An approach, 128 long by 18 feet wide, with a mean height of 5 feet, was built to connect the block to the shore.

A sum of \$81.51 was expended in the spring of 1903 for painting the shed and small repairs to the pier and building. From 10 to 12 feet of water are to be found at the head of the pier at low water spring tides.

## GRANDE VALLÉE.

Grande Vallée County of Gaspé, is on the south shore of the River St. Lawrence, 68 miles below Ste. Anne des Monts, and about 45 miles by land from Gaspé Basin.

With a view of affording much-needed landing and shipping facilities to steamers, schooners and other small vessels calling at this place, together with shelter to fishing boats in stormy weather, it was decided to build a breakwater wharf at this place.



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On June 29, 1901, a contract was entered into with Messrs. Heney & Smith, of Ottawa, for the construction of this wharf near the mouth of Grand Vallée river.

The structure will have a length of 900 feet, a width of 25 feet on top at the inner and 29 feet at the outer end, which will be in a depth of 14 feet at low water spring tides, built throughout of close-faced timber cribwork, with a batter of 1 in 10 on both sides, filled with stone and sheathed on the weather side with hardwood planks 6 inches thick. The top of the work will stand 8 feet above high water spring tides. Spring tides rise 10 feet.

The work was well under way at the end of the fiscal year 1902-3. The expenditure during the year was \$7,468.52.

#### GRINDSTONE.

Grindstone is a village on the south side of Grindstone island, 4 miles east of Etang du Nord. The population is composed mostly of Scotch farmers and Acadian fishermen.

For years past most of the freight for the Magdalen islands has been landed here, and the building of a landing pier was greatly needed. In the fiscal year 1901-2 an approach of 605 feet, 25 to 50 feet wide, and of an average height of  $9\frac{1}{2}$  feet on the outer face, was built along the eastern side of Grindstone cape.

The outside face of the approach, exposed to the heavy easterly gales from the Atlantic ocean, is protected by a sheathing of split spruce logs held in place by two sets of walings fastened by cross-ties and a double set of posts. A mattress of brush was laid under the stone filling taken from the cape.

During the fiscal year 1902-3 the pier was extended 255 feet, with an average width of  $25\frac{1}{2}$  feet and an average height of 19 feet to coping or floor level, and floored. The depth of water at the head of the work is now  $11\frac{1}{2}$  feet at low water spring tides.

A crib 100 feet long by 29 feet at outer end was partly built at the end of June.

The amount charged to Grindstone works during the last fiscal year is \$11,084.80. Spring tides rise 4 feet; neap tides 2 feet.

#### HOUSE HARBOUR.

House Harbour is an important parish on the western end of Allright island, one of the Magdalen islands, in the County of Gaspé.

The pier built at the channel during the fiscal year 1900-1 forms an oblong of 50 feet by 100 feet, with 10 feet of water at the head. A sum of \$64.25 was spent to buy materials for repairs to the flooring. The head of the pier being undermined has settled a foot.

#### HUDSON.

Hudson, in the County of Vaudreuil, is situated on the south shore of Lake of Two Mountains. It is a favourite summer resort.

In October, 1901, the old wharf of Mr. John McNaughton was transferred to the department for the sum of \$800. As the top of the wharf was in an advanced state of decay and dilapidated, it was removed to the lower water level, and rebuilt with an extension of 20 feet long, by 20 feet wide, at the eastern end.

The new wharf is constructed of close-faced cribwork, of a total length of 102 feet by a width of 20 feet, and a stone embankment or approach, of a length of 135 feet, from the shore to the head block, by a width of 20 feet for the first 92 feet from the shore, and a width of 42 feet for the remaining 43 feet to the head block, with sloping sides of 1 in 1, and guard railing. A storehouse, 18 by 24 feet, with waiting-room, was erected at the western angle of the head block and approach. The work was carried out by day labour, and was not completed at the end of the fiscal year 1901-2. The amount



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expended was \$3,999.40. During the fiscal year 1902-3 the work was completed at a cost of \$1,096.90.

The total expenditure on that work, including the purchase price, is \$5,096.30.

## HULL.

Hull, the shire town of the county of Wright, is situated on the Ottawa river, opposite the city of Ottawa. It possesses unrivalled water power privileges and contains a number of saw mills, a pulp and paper manufacture, a match factory, &c., &c.

Two large iron bridges span the river at this point connecting Hull with the city of Ottawa. Population, 15,000.

The work of building a concrete and masonry wharf on the Ottawa river at the foot of Ste. Elizabeth street, was awarded by contract on October 30, 1900.

The wharf consists: 1st, of a landing block 130 feet wide and 70 feet long, built up to three different levels in ten feet of water, and consisting of a cribwork substructure up to low water level, and a superstructure of concrete masonry walls with filling between them. 2nd, an approach from shore to the landing block 403 feet long, built up also to three different levels, consisting of dry rubble masonry walls with filling between them. During the fiscal year 1900-01 the cribwork substructure of the landing block and a portion of the dry walls were built and some filling made, at a total cost of \$9,865.12.

During the fiscal year 1901-02 the work under contract was completed and other works not provided for by contract were performed. These included: the cementing of the joints of the coping stones of the dry masonry walls for 1,200 lineal feet at a cost of \$788.45; the construction of an iron tube railing on both sides of the approach for a length of 718 feet at a cost of \$718, and the construction of a roadway on St. Elizabeth street, 600 feet long, 30 feet wide and protected on both sides by rip-rap walls built at a slope of one to one, at a cost of \$2,615.62.

During the fiscal year 1902-03 some minor works were performed to complete the wharf thoroughly and a substantial freight shed 50 by 40 feet dimensions, and two stories high, was built.

Expenditure for fiscal year, \$3,207.05.

The total expenditure for this work up to June 30, 1903, is \$54,049.76.

## ISLE AUX COUDRES.

This island, with a population of 1,500, is in the county of Charlevoix, 62 miles below Quebec, and one and a half miles from the north shore of the St. Lawrence, the upper end being opposite Baie St. Paul. This island is 9 miles long and 3 miles broad. Spring tides rise 20 feet, neap tides 13 feet.

On November 9, 1901, a contract was entered into with Mr. Michel Francœur for the construction of an addition to the wharf, the contract was fulfilled during the first part of the fiscal year, and the final estimate forwarded on November 17 last.

The work consisted in the construction of an extension 60 by 30 feet, and 42 feet high at the outer end of the wharf. The depth of water at the outer end of the extension is 17 feet at low water.

The expenditure during the fiscal year was \$4,346.32.

## ILE AUX GRUES.

*South Shore.*—Ile aux Grues, or Crane island, with a population of about 750, is an island lying in the St. Lawrence, opposite Cap St. Ignace, 30 miles below Quebec. Spring tides rise 18 feet; neap tides 12 feet.

An isolated cribwork and lighthouse were built near the upper end of the island in 1862. The block was placed about 140 feet inshore from low water mark. In 1881



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it was extended outward 171 feet, to a depth of 4 feet at low water spring tides; and in 1885 the block was connected to the shore by solid cribwork 468 feet long, 25 feet wide. The pier is now 639 feet long, of a uniform width of 25 feet, with the exception of its outer 75 feet, which is 35 feet wide.

The wharf was of little use for local traffic, owing to the want of proper shelter in the vicinity and its inconvenient location, the inhabitants of the island being mostly settled on the north shore of the island, where safe harbouring for all craft is available. For this reason the wharf was left in a bad state of repair until 1902, when it became urgent to renew some portions of the work to prevent serious damage to both the wharf and the lighthouse.

An appropriation was voted by Parliament at its session of 1902, and repairs were commenced in the month of August of that year.

With the exception of the sheathing, the superstructure has been entirely renewed for a length of 330 feet from the outer end and on an average height of 13 feet the stone ballast having to be removed and again put in the repaired portion.

The materials used in the work were: 15,000 lineal feet of spruce timber, from 10 to 12 inches square; 16,000 feet B.M. of spruce deals, and nearly 300 cubic yards of stone ballast. The work was done by day labour during the months of August, September, October and November.

The amount expended was \$4,697.64.

*North Shore.*—As the wharf on the south shore of the island is of little avail to the inhabitants, who all live on the north shore, and to facilitate the shipping of the farm produce from the island, a wharf was constructed by contract on this shore in the year 1901-2, at a cost of \$8,709.66. The wharf has a total length of 730 feet, and consists of a head block 80 feet long by 30 feet wide, and a mean height of 18 feet, and 14 piers 20 feet long and 22 feet wide, placed 24 feet apart and connected by timber spans, together with an approach 34 feet in length, built of stone and gravel. During the last fiscal year an additional length, of 50 feet by 30 feet wide and 20 feet high, was built at the outer end of the work built in the previous year, in order to attain a greater depth of water and accommodate the increasing traffic. The depth of water at the end of the wharf is 14 feet at high water neap tides.

The work was done by day labour at a cost of \$2,533.62.

The total expenditure since the beginning of the work is \$11,215.25.

#### ILE VERTE.

The village of Ile Verte, in the County of Témiscouata, is situated on the south shore of the St. Lawrence 16 miles below Rivière du Loup and 131 miles east of Quebec. It contains flour, carding and saw mills, and has a population of 4,600.

Spring tides rise 19 feet, neap tides 12 feet.

During the fiscal year 1902-3 the following repairs and improvements were made to the wharf :—

The flooring on a surface of 13,200 square feet was renewed with 3-inch spruce deals; a middle pathway, 4 planks wide, has been placed on a length of 600 feet; 75 spruce stringers, 20 feet long, 10 by 10 inches, were used to replace the decayed ones, and to strengthen the decking at some places; face-timbers 200 feet in length, broken by ice or decayed, have been renewed; two coats of paint were applied to the combined freight shed and waiting-room, and the cap timbers and mooring posts have also been painted.

The work was done during the months of August and September at a cost of \$1,467.09.

#### LAPRAIRIE.

Laprairie, the chief town of the county of the same name, is situated on the south shore of the River St. Lawrence, 7 miles above Montreal.



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During the fiscal year 1902-3 one of the ice-breakers, the eastern one, built in 1887 at the upper end of the town, being so rotten and dilapidated that it would no more prevent damage being done to property during the breaking up of the ice in the spring, it was therefore decided to rebuild it.

The old ice pier was removed to the bottom, and a permanent concrete ice breaker was erected in its place. It has a length of 40 feet by a width of 22 feet at the base, and a height of 25 feet. The side facing the St. Lawrence is sloped 1 in 1½.

The work was carried out by day labour at a cost of \$3,653.49. During April, May and June, 1903, extensive repairs were made to the protection wall at a cost of \$1,345.59.

Total expenditure—\$4,997.08.

## LES EBOULEMENTS.

The village of Les Eboulements, in the county of Charlevoix, with a population of 900, is situated on the north shore of the St. Lawrence, 72 miles below Quebec. Spring tides rise 20 feet; neap tides, 13 feet.

The timbers underneath the sheds have been renewed, three rows of face timbers, cross ties and longitudinals have been replaced, and the flooring made anew.

Considerable work was done to the buildings, waiting room and freight sheds; they have been almost entirely rebuilt and two coats of paint applied.

The slips on both sides of the wharf having been damaged by the ice, were thoroughly repaired.

The hardwood sheathing of the outer face has been renewed on half the surface with elm timbers 6 inches thick, 36 spruce fenders 30 feet long, were put up along the south-west face to replace those that had been carried away by the ice.

The movable slip was renewed and fitted with new pulleys. General repairs have also been done to the flooring, cap timbers and sheathing in the whole of the wharf. The work was done by day labour.

The total expenditure incurred during the fiscal year 1902-03 amounts to \$1,960.80.

## LES ECUREUILS.

Les Ecureuils is in the county of Portneuf, on the north shore of the River St. Lawrence, 28 miles above Quebec, it is distant from any railway communication, and difficult to approach by water.

Spring tides rise 17 feet; neap tides, 10 feet.

There is a small government wharf, but owing to a large batture of rocks, it is only available during high water spring tides.

To facilitate the communication by water the sum of \$746.04 was expended towards the removal of rocks, and for repairs to the wharf as well as the construction of a freight shed for the protection of merchandise which is frequently delayed for days on account of insufficient water for the market steamer.

## LES ESCOUMAINS.

Les Escoumains, in the Saguenay county, is situated on the north shore of the River St. Lawrence, 21 miles below Tadousac.

The Saguenay Lumber Company have an extensive saw and pulp mill at this place.

During the fiscal year 1902-03 the sum of \$592.29 was expended in removing the boulders which obstructed the channel.

Spring tides rise 15 feet; neap, 9 feet.

## L'ISLET.

The village of L'Islet, in the county of the same name, is situated on the south shore of the St. Lawrence, 50 miles east of Quebec.



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Spring tides rise 21 feet; neap tides, 13 feet.

The wharf at this place has a length of 1,105 feet, and a width of 31 feet, with a head block 56 feet long 116 feet wide and 34 feet high.

The wharf is substantially built, with close faced timbers throughout; a depth of water of 8 feet is left at low water spring tides along its outer face.

During the fiscal year 1902-03 general repairs were made to the wharf. The slip on the west side, which had been damaged by ice, was repaired, cap timbers have been renewed; the sidewalks were repaired, and the roadway was levelled with sand and gravel.

The work was done by day labour at a cost of \$599.11.

#### LONGUEUIL.

The town of Longueuil, the chef-lieu of the County of Chambly, is situated on the south shore of the River St. Lawrence, nearly opposite the eastern end of the city of Montreal.

During the fiscal year 1902-3 repairs were effected to the government wharf at that place. They consisted in renewing about 500 lineal feet of the last tier of timber, which had been damaged and broken by the ice. The up stream side of the wharf has been protected by steel boiler plates 4 feet wide on a length of 500 feet, which has given satisfaction. During the last breaking up of the ice no damage was caused.

The work was carried out by day labour at a cost of \$1,123.33.

#### LOTBINIÈRE.

Lotbinière, in the County of Lotbinière, is situated on the south shore of the St. Lawrence, about 40 miles above Quebec.

Spring tides rise  $14\frac{1}{2}$  feet; neap tides  $8\frac{1}{2}$  feet.

An isolated block, for connection with the shore by a trestle approach, was constructed by the department in 1896. This was somewhat damaged by ice pressure during the winter of 1900, and, being found too small, it was decided in 1901 to strengthen and enlarge it, the work to be done by day labour.

The block is located about 500 feet from the shore. The trestle approach, which has to be placed every spring, is usually delayed, when most required, by high water.

During the fiscal year the work of enlargement, commenced in 1901 was continued. A portion of a foundation crib was also constructed to facilitate the earlier placing of the trestle approach in the spring.

The expenditure amounted to \$2,369.42.

#### MARIA.

Maria, County of Bonaventure, is a prosperous village on the north coast of the Baie des Chaleurs, and a station of the Baie des Chaleurs Railway, about 10 miles north-east of Carleton. Population, 2,300.

On May 31, 1902, a contract was entered into with Messrs. J. Burns and W. J. Laughrin, of Ottawa, for the construction of a wharf at this place. The structure has a total length of 932 feet, of a uniform width of 20 feet, covered with 3-inch planks. Its outer end reaches a depth of 4 feet at low water spring tides, which here rise 9 feet, the top of the wharf being 4 feet above high water spring tides.

The outer end of the wharf, for a length of 730 feet, is built of solid close-faced timber cribwork, filled with stone ballast. The remaining length of 202 feet, at the shore end, consists of five separate cribs or piers, 20 by 20 feet, placed 20 feet apart, and connected with stringers covered over with 3-inch planks. A short stone approach connects the shore with the first crib. The outer end is provided with a landing slip on the west side.



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At the end of the fiscal year 1902-3 the work had been completed to within 4 feet of the top, but has since been entirely completed.

The expenditure at the end of the fiscal year was \$11,991.13.

## MATANE.

The village of Matane, in the County of Rimouski, is situated on the south shore of the St. Lawrence, at the mouth of the River Matane, 240 miles below Quebec, and 30 miles from Little Métis station, the nearest point of the Intercolonial Railway. It contains extensive sawmills and a spoolwood factory.

During the fiscal year 1902-3 boulders and tree stems, which obstructed the channel of the harbour, were removed at a cost of \$9.

Spring tides rise 14 feet; neap tides 7 feet.

## MONTREAL HARBOUR (LOWER DIVISION).

The work of constructing the high level pier at Maisonneuve has gone steadily on from July 1 to December, 1902, and then from April, 1903, to the end of the fiscal year. Nine sections of the cribwork were sunk and loaded, which, added to the 5 already in place, made a total of 14 sections at the end of 1902.

The building of concrete footing blocks, which had only begun in the previous year, was carried on during July, August and September, 1902, and a total of 1,100 footing blocks built at the quarry, of which 380 were laid in the work.

The building of monolithic concrete walls was also begun in September, 1902, and a length of about 800 feet built to a height of 18 feet above datum.

The filling behind the walls was carried on as the work progressed, and the earth embankment brought to within 4 feet of the top of the wall, or to 14 feet above datum along the western bulkhead.

Filling was also deposited along the centre line of the new pier, and in rear of the cribs sunk during the season along the south-western line of the wharf. •

At the opening of navigation the work was resumed, and the bottoms for five sections of the cribwork wall were built and launched, these being 6½ feet deep at the time of launching. The excavation for the eastern line of cribs was advanced.

The building of the concrete walls resumed at the extreme west end of the bulkhead, and carried to 28 feet above datum, being 5 additional feet on the proposed height of 23 feet.

The length of wall built was 800 feet to the end of section No. 5.

The water was too high until August to resume the laying of the footing blocks, so that the building of the concrete walls had to be adjourned, when the wall built in 1902 had been completed.

At the end of the fiscal year there remained to complete the work, the following items :—Six sections out of 20; 2,300 feet of concrete wall to build out of 3,100; and about 860 footing blocks out of 1,240.

There remained to excavate the site of three sections, or about 500 feet in length, and the refilling of two-thirds the area of the pier.

The expenditure during the fiscal year 1902-3 was \$251,320.47.

## NEW CARLISLE.

New Carlisle, on the north shore of the Baie des Chaleurs, is the chief town of the county of Bonaventure, distant 65 miles from Campbellton, N.B. A pier 606 feet long, from 29 to 49 feet wide and reaching 15 feet depth at low water spring tides, has been built at this place by the department between 1881 and 1883.

In 1890-91 an extension of 70 feet in length was built, with its outer end in 16 feet of water at low tide.



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Spring tides rise  $6\frac{1}{2}$  feet; neap tides  $3\frac{1}{2}$  feet.

During the last fiscal year the landing slip on the east side of the wharf, which had been damaged during a storm, was repaired. Some of the planking being broken or removed was replaced.

The expenditure amounted to \$67.

#### NOTRE DAME.

The village of Notre Dame is situated on the west side of Lake Témiscouata, on the Témiscouata railway, about midway between River du Loup and Edmunston, in the county of Témiscouata.

It is the centre of an extensive lumber trade; two steamboats and numerous other vessels are plying over the lake during the season of navigation, which does not usually close before the beginning of January.

Lake Témiscouata is 30 miles long, the width varies from  $1\frac{1}{2}$  to 3 miles.

In order to provide landing accommodation on both sides of the lake, two small piers of open faced cribwork were commenced at Notre Dame du Lac during the month of October, 1900; one on the west shore, opposite the church, and the other on the east side. The expenditure during that year was of \$1,068.37.

In 1901 these piers were raised 5 feet at the outer ends and brought level to the shore ground; they were filled with stone ballast and planked over with spruce deals.

Stairways were provided for landing at low water stage. The two piers were also sheathed on all sides.

The amount expended in that year was \$1,185.72.

During the fiscal year 1902-03 the sum of \$1,124.72 was expended in building a close faced extension, 30 by 25 feet and 17 feet high, to the pier on the west side of the lake.

The total expenditure, since the beginning of the two works, has been \$3,378.81.

#### PERCÉ.

Percé, the shire town of the county of Gaspé, is situated on the Gulf of St. Lawrence, 36 miles from Gaspé Basin. The harbour consists of two small coves called the north and south cove.

In 1888-89 a landing pier was constructed in the south cove. Owing to the difficulty of approaching the pier in stormy weather, on account of the foul ground in the vicinity and the poor shelter it afforded, the department decided to build a landing pier in the north cove. In the month of April, 1900, a contract was awarded to Messrs. Heney & Smith, of Ottawa, for the construction of a pier 670 feet long, 20 feet wide on a length of 260 feet, and tapering to a width of 29 feet at the outer end, which stands in a depth of 13 feet at low water spring tides. The structure is built of close-faced timber cribwork throughout, filled with stone and sheathed on the east side with hardwood planks, 6 inches thick.

At the end of the fiscal year 1902-03 the work was nearly completed, only 120 feet of sheathing remaining to be done. The expenditure during the fiscal year was \$4,945.02.

#### PETITE RIVIÈRE (STE. ANNE DE MONTS).

Petite Rivière, Ste. Anne de Monts, in the county of Gaspé, empties into the St. Lawrence at St. Anne de Monts, 108 miles below Rimouski.

During the fiscal year 1902-03 a sand bank obstructing the entrance to the river was removed, and a timber protection was built to keep the channel opened.

The amount expended was \$128.36.



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## PHILLIPSBURG.

The village of Phillipsburg is situated on the east shore of Missisquoi bay, Lake Champlain, in the County of Missisquoi.

*Construction.*—On July 29, 1895, a contract was entered into for the construction of a wharf at that place, the municipality having subscribed \$4,000 towards its cost. The work was completed in 1897 at a cost of \$11,142.89. It consists of a breakwater or head block, 120 feet long and 25 feet wide, of a trestlework approach 302 feet long and 30 feet wide, and of a stone and earth embankment 285 feet long and 30 feet wide at top, with side slopes of  $1\frac{1}{2}$  to 1. The outer face of the breakwater is  $17\frac{1}{2}$  feet above the bottom of the bay, and stands in  $7\frac{1}{2}$  feet of water at extreme low water.

*Repairs.*—The embankment was considerably damaged by ice and high water in April, 1897. It was thoroughly repaired during the year 1898, and the ballast chambers along the outer face of the breakwater were filled with stone ballast, at a cost of \$711.79. During April and May, 1903, the flooring of the head block and trestle approach being rotten and broken, were renewed; some repairs were also made to the front sheathing and to the stone embankment at a cost of \$580.57.

The total amount expended on this work is \$12,928.15, of which \$11,635.79 was for surveys and construction, and \$1,292.36 for repairs.

The work is now in good condition.

## POINTE À ELIE.

Pointe à Elie is the extreme south-easterly point of Allright island, 2 miles east of the House Harbour Catholic Church.

The steamer 'Amelia' calls at Pointe à Elie for mails, and freight and for shelter during north-easterly gales.

The construction of a landing pier and breakwater will give here the best of shelter for all storms, and specially from easterly gales that prevail in the spring.

During the fiscal year 1902-3 a length of 115 feet by  $22\frac{1}{2}$  feet wide of the pier proper was built, 850 feet of roadway, from 25 to 50 feet wide, and of an average height of 9 feet, was also built of stone with a timber face held in place by walings, posts and cross-ties.

A crib of 24 by 94 feet is being built.

The amount expended during the fiscal year was \$8,058.40.

## POINTE AUX ESQUIMAUX.

Pointe aux Esquimaux, in the united counties of Chicoutimi and Saguenay, is situated on the northern shore of the River St. Lawrence, 525 miles below Quebec.

Pointe aux Esquimaux is the chef-lieu of the north shore. It contains one Roman Catholic church, one convent, an hospital, three stores, &c. It is one of the most important trading posts for the traffic of fish, furs and oil.

The wharf purchased by the government in 1895 had a length of 125 feet and a width of 30 feet. In 1895-6 it was lengthened 60 feet by the construction of a block 30 by 30 feet and 42 feet in height, connected with the old work by a platform 30 feet in length. The wharf is now 185 feet in length, 30 feet wide, and has a depth of water at its outer end of 24 feet at low water.

During the fiscal year 1902-3 a block of 30 by 30 feet, and 50 feet high, was built in 41 feet of water, 15 feet from the outer end of the wharf, and connected thereto by stringers 8 by 10 inches and 3-inch tamarack deals.

Spring tides rise 5 feet, neap tides 3 feet.

The amount expended during the year was \$1,598.17.



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## POINTE FORTUNE.

Pointe Fortune, a post village in Vaudreuil county, is situated on the south shore of the River Ottawa, 7 miles from Grenville, and 45 miles north-west of Montreal. It contains two churches, two stores, 2 hotels, &c. It is the terminus of a branch line of the Canadian Pacific Railway to Rigaud.

In order to better accommodate the traffic by water, the Crown purchased from Mr. W. Brown a wharf 224 feet long, parallel with the shore, together with two rights of way, one at each end of the wharf, connecting with the public road. These roads are respectively 130 and 120 feet long by 18 and 20 feet wide, and a strip of land between the roadways, 158 feet long by 50 feet wide, 80 feet from the public road and adjacent to the wharf, was also purchased, to be used as a cattle yard—the whole for the sum of \$1,000.

The top of the structure, which was in a bad state of decay, has been removed down to 1 foot below low water on a width of 10 feet, and the wharf rebuilt on sound foundations, with close-faced cribwork, well ballasted with stone. The new work is 19 feet high for the upstream 100 feet of its length, thence sloping upward to a height of 13 feet in the next 40 feet, and level for the remaining 84 feet. The wings at both ends are 25 feet long, joining the high ground of the shore. The outer face is built to a batter of 1 in 12, and the upper and lower corners are protected with steel boiler plates  $\frac{3}{8}$  inch thick. The top of the wharf, for a width of 12 feet from the outer face, is covered with 3-inch planks.

The work was carried out by day labour; commenced in October, 1902; open to traffic in May, 1903, but not entirely completed on June 30, 1903.

The expenditure on this work at the end of the fiscal year was:

Purchase price . . . . .	\$1,036 80.
Construction . . . . .	3,999 71
	<hr/>
Total . . . . .	\$5,036 51

## • POINTE ST. PIERRE.

Point St. Pierre, county of Gaspé, is situated at the western entrance of Gaspé bay, 21 miles from Gaspé Basin and 15 miles north of Percé.

In order to afford shelter to fishing boats during easterly winds, and provide deep water berths along the inner face for large schooners, the department decided to construct a wharf at this place.

In September, 1902, a contract was entered into with Messrs. Heney and Smith, of Ottawa, to build a wharf 420 feet long, 22 feet wide on top and 28 feet wide at the outer end which stands in a depth of 15 feet at low water spring tides.

The wharf is built of close-faced timber cribwork, filled with stone and sheathed on the seaward face with hardwood planks 6 inches thick. Spring tides rise 5 feet.

At the end of the fiscal year 1902-03 only part of the work had been built. The amount expended during the year was \$3,735.25.

## PORT DANIEL.

The village of Port Daniel is on the north shore of the Baie des Chaleurs, in the county of Bonaventure, about 75 miles east of Campbellton, N.B., and 45 miles west of Percé.

Spring tides rise 6 feet; neap tides, 3 feet

The wharf at this place is 425 feet long, and reaches to a depth of 13 feet at low water spring tides.

During the last fiscal year the sum of \$200 was expended on repairs to the freight shed, also in planking over the old flooring on the middle of the roadway, with 2-inch planks, on a length of 350 feet.



## SESSIONAL PAPER No. 19

## QUEBEC HARBOUR.

In order to afford more accommodation for ocean steamers in the harbour of Quebec, the department decided in 1902 to build an extension, 462 feet long, in a northerly direction, to the present breakwater built many years ago on the river front of the harbour. On May 8, 1903, a contract was awarded to Messrs. Duseault and Lemieux, of Lévis, for the construction of the extension. The new work will have a depth of 42 feet at low water at its outer face; it is built of timber cribwork, filled with stone up to 3 feet above low water spring tides, and founded on a bed of rubble stone 4 feet thick; on the top of the cribs, the superstructure will be built of concrete for its total height of 21 feet, and will reach to 6 feet above high water spring tides. The back of the cribs and concrete superstructure will be filled to coping level with dredged materials, forming an embankment which will increase the available top area by about 166,200 superficial feet. The back of the embankment will be protected by a retaining wall built of open-faced cribwork, sheathed on the outer face.

At the end of the fiscal year 1902-03 one of the cribs, 155 feet long, had been built to a height of 12 feet, 150 feet of cribwork retaining wall had been sunk, 5,000 cubic yards of filling deposited, and a considerable quantity of materials delivered. The amount paid to the contractors on June 30, 1903, was \$18,831.65.

## RICHMOND.

Richmond, an incorporated town in Richmond county, is on the St. Francis river, and a station of the Grand Trunk Railway; it is 76 miles from Montreal. It contains besides the county buildings, 4 churches, 26 stores, 3 hotels, 1 grist mill, 1 branch bank, 2 printing offices. It is connected with Melbourne on the west side of the river by an iron bridge.

During the spring freshets, almost yearly, the town of Richmond is flooded to a depth of 5 or 6 feet, owing to ice jams on the River St. Francis, at a place called 'The Narrows.' In order to prevent these ice jams and floods, which have caused considerable damage in past years, it was decided to build four ice breakers above 'The Narrows.' In December, 1902, a contract was entered into with Mr. William Ross, for the construction of the four ice breakers for the sum of \$10,317.00.

One of the ice breakers, situated above the municipal iron bridge, was completed on March 25, 1903. It proved very effective; the bridge, which was carried away the previous year by the ice and rebuilt, suffered no damage, and there was no overflow of the river.

At the end of the fiscal year the three other ice breakers were commenced, but not completed.

The expenditure to June 30, 1903, was \$5,832.84.

## RIVIÈRE DES VASES.

Rivière des Vases is in the county of Témiscouta, 125 miles below Quebec and 6 miles west of Isle Verte.

The sea-grass industry, which is the chief trade of the place, having grown considerably, and also to provide better landing accommodation for the people living on the island opposite, the construction of an open faced cribwork pier was begun along the eastern bank of the river. During the year 1900 a section 100 feet in length, 30 feet wide, and 8 feet high at the outer face, was commenced, but not completed; the expenditure was \$499.63.

In 1901 the work begun the previous year was finished, and an addition of 32 feet long of similar work was built at a cost of \$498.98.

During the fiscal year ended June 30, 1903, the part already built which had settled, was levelled, and a further extension, 35 feet in length, of the same width and height as



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that built previously, was constructed, the expenditure being \$498.05; a claim for damage to property having been made, the sum of \$10 was paid in settlement, forming a total expenditure since the beginning of the work up to June 30, 1903, of \$1,506.66.

## RIVIÈRE NOIRE.

Rivière Noire is in the parish of St. Jean de Matha, Joliette county.

In order to prevent the continuous landslides and to give better facilities for the drive of logs, the wharf or barrage, built some years ago on one of the channels at the head of a little island, was removed and rebuilt on the other channel. It has proved effective, and has given satisfaction.

The work was commenced in October and completed in November, 1902, at a cost of \$247.96.

## RIMOUSKI.

Rimouski, the chief town of the county of the same name, is situated on the south shore of the St. Lawrence, 180 miles below Quebec; it is an important station on the Intercolonial railway, with a population of nearly 2,000. A large quantity of lumber is shipped from this place for the European market. It is also the point where the transfer from the steamers to the cars of European mails and passengers is effected during the season of navigation.

Spring tides rise 15 feet; neap tides, 8½ feet.

Owing to sea worms and also to decay, the face timbers at the outer end of the Rimouski wharf were weakened and carried away, causing that part of the structure to sink down some three feet. The stone ballast has fallen out through the opening left by the broken timbers to such a height as to become dry at low tide, forming a serious obstruction to navigation.

During the fiscal year 1902-03 a diver was employed to remove the obstruction; about 450 cubic yards of stone were hauled up and put into the wharf at places where ballast was needed. In the meantime, the slip on the western side of the wharf was repaired. The flooring and stringers on a length of 160 feet were completely renewed. Some repairs have also been done to the top planking over the whole length of the wharf, and numerous iron bolts projecting out of the face timbers were driven in.

These works were carried out at a cost of \$1,100.81.

During the month of April, 1903, the coal shed erected upon the head of the wharf was thoroughly restored, and the sum of \$210.70 expended for that object, forming a total expenditure for the fiscal year ended June 30, 1903, of \$1,311.51.

## RIVIÈRE BLANCHE.

The village of Rivière Blanche, or St. Ulric de Matane, county of Rimouski, is situated on the south shore of the St. Lawrence, 9 miles west of Matane and 25 miles east of Métis. It contains large stores, a creamery and sawmills; a considerable quantity of lumber is shipped from this place.

During the fiscal year ended June 30, 1903, to complete the repairs undertaken the previous year, the following works were effected, viz.: The flooring, stringers and cap timbers were renewed on a length of 150 feet; the flooring on the north and east part of the outer block having been carried away by waves on a surface of 2,000 square feet, was replaced with most of the stringers, a middle pathway, four planks wide has been placed over the whole length of the wharf, 550 feet, and minor repairs were also done to the structure.

The sand having accumulated to a great extent inside the outer block, some work was done to remove part of it, and a depth of water of 2 feet has been gained thereby.

The amount expended during the fiscal year is \$750.



## SESSIONAL PAPER No. 19

## RIVIÈRE DU LOUP.

Rivière du Loup, or the town of Fraserville, is the chef-lieu of the County of Témiscouata. It is situated on the south shore of the St. Lawrence, 114 miles below Quebec. It is a thriving little town of nearly 4,000 inhabitants, which contains several manufactories, including two pulp mills.

The Rivière du Loup point, where the wharf is located, is distant 2 miles from the town. It is one of the best known and most frequented summer resorts of the St. Lawrence.

Spring tides rise 19 feet, neap tides, 12 feet.

Owing to the action of the ice and waves, also the considerable wear and tear due to a heavy lumber traffic, annual repairs are required on this wharf.

During the fiscal year 1902-3 the following works were performed:—Repairs to the slip on the north-west side of the wharf; 270 feet of spruce, 12 by 12 inches, were used to renew the face timbers broken by the ice; 2,594 feet of timber, 12 by 10 inches, have been employed for the renewal of the cap timbers, which were decayed and carried away; a railing 1,591 feet long, 3 feet high, was built with spruce timber 6 inches square and painted, to replace the one broken by the waves during a heavy storm; the stairway on the west side of the wharf has been repaired, and the angle sheathed on a surface of 240 square feet, with spruce timber 9 by 6 inches, and secured by iron straps; 129 fenders of spruce timber 24 feet in length, and 9 by 7 inches, have been placed to protect the facings against the wear of the scows carrying timber; 8 mooring posts were placed to renew the broken one, and 4 ladders added where needed. Lastly, 13,500 feet B.M. spruce deals have been used to repair the top flooring.

These works were done by day labour, during the months of July, August and September, at a cost of \$2,969.21.

## ROBERVAL.

The town of Roberval, in the County of Chicoutimi, is built on the east side of the River Ouïatchouanish, near its mouth, on the south shore of Lake St. John, 200 miles north-east of Quebec city, and is the northern terminus of the Roberval branch of the Quebec and Lake St. John Railway, which taps the main line at Chambord station.

During the fiscal year 1902-3 a block of cribwork 60 feet long, 15 feet wide, and 25 feet high, was sunk on the southern side of the wharf at the outer end, thus making the head 15 feet wider on a length of 60 feet. From the inner end of the new cribwork to the shore, a distance of 340 feet, a trestlework was built for the railway track which the Quebec and Lake St. John Railway intend to lay as far as the outer end of the wharf. The bents of the trestlework are 8 feet apart, built of 12 by 12-inch spruce timber and 12 by 12-inch stringers on top to receive the sleepers.

The amount expended during the fiscal year was \$4,577.11.

## SOREL.

The trestles of the pile wharf were begun in August and completed in November.

The superstructure of the cribwork was completed in 1902 to within 5 courses of the top, which were finished in 1903.

The sheathing of the cribwork was completed in June, 1903.

Dredging was commenced on April 13, 1903.

The filling at the end of the fiscal year covered three-fourths of the required area, but the earth excavation not being proportionately advanced a third dredge was added so as to finish the work before the end of the present season.



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During the present fiscal year the expenditure was:

On contract . . . . .	\$139,324 24
On extra work . . . . .	5,455 85
Total . . . . .	<hr/> \$144,780 09

The chief items being:

- Excavation—397,300 cubic yards.
- Iron in bolts, &c.—192,970 lbs.
- Stone filling—27,700 cubic feet.
- Timber of all kinds—185,700 cubic feet.

#### ST. ALEXIS.

St. Alexis is on the south side of Ha! Ha! Bay, River Saguenay, about 63 miles from its mouth.

During the last fiscal year an extension to the shore wharf, 150 feet in length, 25 feet wide, and 21 feet high at outer end, was built. The structure is built of open-faced cribwork, with 11 by 11-inch face timbers, fenders at every 10 feet; 3-inch tamarack deals were used for the flooring; the work was fully ballasted.

Spring tides rise 13 feet, neap tides 11 feet.

The expenditure for the fiscal year is \$3,994.71.

#### ST. ALPHONSE DE BAGOTVILLE.

St. Alphonse is at the head of Ha ! Ha ! Bay, on the southern shore of the River Saguenay, 66 miles from its mouth.

A landing pier was built here, prior to Confederation, at a cost of about \$3,200.

During the fiscal year 1902-3 general repairs were made to the flooring, the shed, and new fenders were placed. The shed was roofed with sheet iron. The amount expended was \$1,500.

Spring tides rise 18 feet, neap 11 feet.

#### ST. ANDRÉ.

The village of St. André, in the county of Kamouraska, is situated on the south shore of the St. Lawrence, about 15 miles west of River du Loup, and 100 miles below Quebec.

The place is somewhat frequented as a summer resort; it contains a foundry and an important threshing machine factory.

Spring tides rise 19 feet; neap tides, 12 feet.

The wharf owned by the department at St. André consists of an earthen embankment 850 feet long, on a mean height of 6 feet, and nine piers connected by platforms of 30 foot spans.

A head pier, 25 by 25 feet and 15 feet high, was built in 1900, and the earth approach was repaired. The expenditure for that year was \$4,048.79.

In 1901 a sum of \$300 was expended in repairing the approach.

During the fiscal year ended June 30, 1903, the addition to the wharf, which had not been finished in 1900, was completed; the crib has been brought to the level of the old wharf, and connected to it with a platform of 26 feet span, supported by a small pier 12 feet wide. A middle pathway, 4 planks wide, 76 feet long, was placed over the top planking. The repairs and improvements to the earth approach to the wharf have been continued; a length of 155 feet was thoroughly repaired, the expenditure being \$999.88.

The whole amount expended since the year 1900, inclusively, is \$5,348.67.



## SESSIONAL PAPER No. 19

## STE. ADELAIDE DE PABOS.

Ste. Adelaide de Pabos, commonly called Little Pabos, is an important parish in the county of Gaspé.

In 1888, in order to afford shelter to the fishing boats of the locality, a breakwater was built 200 feet long, 24 feet wide at bottom and the top of the seaward face sloping 1 in 1 on a height of 6 feet, leaving the top of the breakwater 18 feet wide.

In order to prevent the heavy seas from rolling over the breakwater, the top was remodelled during the last fiscal year.

The work consisted in removing the sloping face on the sea side, and building instead a perpendicular wall 12 feet wide from the level of the foot of the old slope on the total length of 200 feet and 9 feet high, or 3 feet higher than the original top, the top of the new work was planked over with 6-inch spruce deals.

New face timbers were put in to replace broken ones on a height of 10 feet and length of 200 feet; stone ballast was added where needed; the whole of the outer face of the breakwater was sheathed with black birch, 6 inches thick and the corners secured with 8 iron straps, 14 feet long.

The amount expended was \$2,925.47.

## STE. ANNE DU SAGUENAY.

Ste. Anne du Saguenay, in the county of Chicoutimi, is situated on the north shore of the Saguenay river, opposite Chicoutimi, 72½ miles above Tadousac; its population is 2,500. Besides the church and post office, the parish contains eight stores, four cheese factories, a limekiln, a brickyard and a pottery. The only market for the produce of the farms of this section of the north shore of the river, is Chicoutimi.

Spring tides rise 15 feet; neap tides, 8 feet.

During the fiscal year 1902-03 a movable slip for the wharf was built, part of the flooring was renewed and a waiting room was partly built.

The expenditure was \$1,339.07.

## STE. FAMILLE, ISLAND OF ORLEANS.

Ste Famille, is situated on the north shore of the Island of Orleans, in the county of Montmorency, and 17 miles below Quebec.

Spring tides rise 19 feet; neap tides, 13 feet.

During the last fiscal year an extension, 60 by 60 feet and 30 feet high, was built at the end of the wharf. The structure is built of timber cribwork filled with stone ballast, with a landing slip at the outer end, the work was done by day labour.

The older portions of the wharf were also repaired; fenders and part of the sheathing were renewed. The amount expended during the fiscal year 1902-03 was \$4,402.14.

## ST. FRANÇOIS, ISLAND OF ORLEANS.

St. François, in the county of Montmorency, is situated at the lower end of the Island of Orleans, 6 miles below the village of St. Jean, and 24 miles below Quebec. The parish extends to both shores of the island and about half way to St. Jean. Spring tides rise 19 feet; neap tides, 13 feet.

About 20 years ago a wharf was built on the north shore of the island; the structure is accessible only at high tide, and is of little avail for the shipping of the farm produce of this part of the island; further, no regular coasting vessel frequent the north channel.

With a view to afford shipping and landing facilities, it was decided to build a wharf about one quarter of a mile above the church of St. François, on the south shore where a daily line of market steamers is established.



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On February 7, 1903, a contract was entered into with the W. J. Poupore Company to build an isolated block of close-faced timber cribwork, 50 feet long and 80 feet wide, on the channel face, sunk in a depth of 12 feet at low water spring tides, the block stands at a distance of about 300 feet from low water mark, and is intended to be connected with the shore at a future date.

At the end of the fiscal year 1902-03 about one-third of the structure had been built, and the amount paid was \$4,575.89.

Urgent repairs were made to the planking of the wharf on the north side, which amounted to \$341.66.

#### ST. FULGENCE.

St. Fulgence, otherwise called l'Anse aux Foins, is a village in Chicoutimi county, on the north shore of the Saguenay river, 10 miles below Chicoutimi. It contains one church, four stores and two sawmills; population of parish, 1,200.

Spring tides rise 20 feet; neap tides, 13 feet.

In 1897-98 the department commenced the construction of an isolated block of close-faced cribwork to give shelter to schooners and bateaux employed in loading steamers at Anse aux Foins. This block is 60 feet long and 30 feet wide, sunk in 10 feet of water at low water spring tides, at a distance of about 2,500 feet out from high water mark.

During the fiscal year 1902-03 the corners of the block were sheathed with boiler plate, a shed was built, and repairs to the planking and to the sheathing were made.

The expenditure for the fiscal year was \$747.86.

#### STE GENEVIÈVE.

Ste. Geneviève, a post office and a parish of Jacques-Cartier county, is on Rivière des Prairies, and on the Grand Trunk and Canadian Pacific railways, 3 miles from Beaconsfield and 5 miles from Pointe Claire. The village contains one church, one convent, two hotels, butter and cheese factories, one telegraph office and fourteen stores. There are excellent mineral springs in the vicinity.

During March, 1903, the sum of \$135.45 was expended to effect some repairs to the pier at that place, four stringers were renewed and the floor was repaired.

#### ST. IRENÉE.

This village is situated on the north shore of the St. Lawrence, in the County of Charlevoix, 78 miles below Quebec, and 5 miles west of Murray Bay wharf.

Spring tides rise 19 feet, neap tides 13 feet.

In the spring of 1902, during a heavy storm, the terrace, at the inner end of the wharf, was completely washed away and disintegrated. In order to provide for a more substantial work, this approach was rebuilt with close-faced cribwork, thoroughly ballasted, and backed up on the east side with large stones, which were put after having taken away a thickness of 3 feet of sand, so as to obtain a hard bottom. Minor repairs were also done to the wharf. The work was done by day labour, and amounted to \$600.

The contract for the extension of the wharf, awarded to Mr. Trudel, was completed by the end of June, except that part of the sheathing which he refused to do. This was done by the Department of Public Works and charged to the contractor. The extension consists of close-faced cribwork 80 feet wide, 35 feet long on the east and 45 feet long on the west side, and 43 feet high, sunk at the end of the wharf in a depth of 18 feet at low water spring tides.

The old slip was taken out and placed at the end of the new extension.



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The expenditure for the fiscal year 1902-3 was:

Extension to the wharf . . . . .	\$6,340 25
Repairs . . . . .	600 00
	<hr/>
	\$6,940 25

## ST. JEAN, ISLAND OF ORLEANS.

At St. Jean, county of Montmorency, the flooring of the wharf was partly repaired with 3,000 feet B.M. of 3-inch deals, at a cost of \$110.26.

## ST. JEAN PORT JOLI.

The village of St. Jean Port Joli, in the county of L'Islet, is situated on the south shore of the St Lawrence, 60 miles below Quebec.

Spring tides rise 21 feet; neap tides, 13 feet.

The wharf has a length of 454 feet, consisting of a shore part or approach, composed of piers connected by platforms, 180 feet long and 18 feet wide; a middle section 174 feet in length, open-faced cribwork and a head block 100 feet long and 38 feet wide. The height of the outer face being 26 feet, with a depth of water 5 feet at low water spring tides.

During the fiscal year 1902-03 the sum of \$818.72 was expended in renewing the flooring, which was totally worn out, the cap timbers were all renewed, and seven mooring posts put in. To strengthen the platforms, timber supports were put underneath.

## ST. JEROME.

St. Jérôme is a village situated on the south bank of Lake St. John, 24 miles east of Roberval. Besides the church, post office, telegraph and railway station, the parish contains several stores, three cheese factories and two sawmills.

During the fiscal year 1902-3 a block 60 feet in length by 25 feet wide, and 27 feet high, was sunk in 7 feet at low water and 110 from the end of the present wharf, to which it is intended to be connected by the construction of two piers in the intervening space. The block is built with a slip at the outer end, sheathed with 8-inch hardwood planks and fully ballasted. The amount expended was \$2,908.48.

## ST. LAURENT, ISLAND OF ORLEANS.

St. Laurent, in the County of Montmorency, is situate on the south side of the Island of Orleans, 10 miles below Quebec. The place is somewhat frequented as a summer resort.

Spring tides rise 20 feet, neap tides 13 feet.

In the month of June, 1902, a contract was entered into with Messrs. Dussault & Lemieux for the construction of an addition to the wharf, 70 feet long by a width of 60 feet. The work has been performed in the course of the past fiscal year; the contract price was \$16,598. In order to facilitate the landing at every stage of the tides, the new extension is furnished with a slip moved automatically by the action of the tides on sheet-iron pontoons, placed in chambers built in the body of the wharf. The slip and pontoons are connected together by means of four wire cables passing around sheaves at the bottom of the chambers, and around heavy pulley blocks secured to trestles at the top of the work. The slip was placed in position in the month of May last, and is now in good working order.

During the month of March, 1903, an agreement was made with the contractors to move the shed and the lighthouse, which were standing on the old part of the wharf, and rebuild them on the new extension, the top part of the lighthouse being placed on



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the roof of the shed. This work was performed in the months of March and April, at a cost of \$1,200.

In the course of the month of June, the sum of \$357.90 was expended in doing some additional work required; \$918.08 were paid for wages to the inspector of the contract work, and for the purchase of winches, wire cables and pulley blocks. The total expenditure for the fiscal year 1902-3 was \$19,370.32.

## ST. MATHIAS.

St. Mathias, a post village and parish in Rouville county, is on the Richelieu river 3 miles from Richelieu. The village contains one Roman Catholic church, one store one sawmill. Population of the parish, 800.

It had been decided to build a landing pier at that place in 1901, but owing to some difficulty in the purchase of the right of way and site of the proposed wharf nothing was done until 1902, except the purchase of building materials that were procured at a cost of \$2,263.43.

In October, 1902, the purchase from the church wardens of the site and right of way of the proposed wharf, with a certain piece of land of an area of 5,200 feet, to be used as a cattle yard, for the sum of \$500, having been completed, the work was commenced and completed in June, 1903.

The structure is a close-faced cribwork block of a length of 90 feet by a width of 20 feet for a length of 60 feet from the up-stream end, and a width of 35 feet for the remaining 30 feet, and a stone embankment of a length of 135 feet, from the shore to the head block, by a width of 35 feet, with slopes 1 in 1 on both sides, and a layer of 1 foot of gravel and sand on top. The outer face of the head block is 21 feet high, and stands in 10 feet at the low stage of the water. The up-stream end of the head block is sloped 1 in 1½, and sheathed with pine timber 8 inches in thickness.

The work was carried out by day labour. The expenditure, during the fiscal year 1902-3, was \$2,497.26.

The total expenditure on this work was \$4,726.17.

## ST. MICHEL.

St. Michel is on the south shore of the St. Lawrence, in the county of Bellechasse, 15 miles below Quebec. The site of the village is picturesque, and the place is somewhat frequented as a summer resort. A coasting steamer calls daily at this place for the traffic in farm produce from the surrounding country. Spring tides rise 21 feet; neap tides, 13 feet.

The heavy repairs to the wharf, commenced in 1900, have been continued during the past fiscal year; the following works were executed. The superstructure was renewed for a length of 575 feet, on a mean height of 7½ feet on half the width of the wharf. The top planks were renewed over a surface of 16,000 square feet with spruce deals 3 inches thick, and cappings renewed on a length of 1,300 feet; 62 fenders from 12 to 20 feet long, and 6 mooring posts have been placed. The western face of the outer block was sheathed over a surface of 580 feet with oak and elm planks 5 inches in thickness and 250 loads of stone ballast were added. The kinds of timber used were cedar and pine.

The work was done by day labour during the months of July, August, September and October, 1903, at a cost of \$3,997.53.

## ST. NICHOLAS.

The village of St. Nicholas, in the county of Lévis, is on the south shore of the St. Lawrence, 14 miles above Quebec.

Spring tides rise 18 feet, neap tides, 12 feet.



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For many years a small steamer has called at this place for the considerable traffic in farm produce derived from the fertile surrounding country. The pier consists of an approach 150 feet long, a section of 280 feet in length and  $20\frac{1}{2}$  feet wide, and a head block 100 feet long, widening from 21 to 62 feet at the outer face. The depth of water at the outer end is 10 feet at low water spring tides.

In the spring 1901, during the ice shove, the outer part on a length of 60 feet was overturned and carried away. In the following season a sum of \$1,271.89 was expended towards the removal of the débris, and the purchase of some timber in view of the reconstruction of the part carried away. Subsequently, it was decided to ask for tenders, the contract was awarded to Messrs. Dussault and Lemieux, of Lévis. The work was completed during the first part of the fiscal year 1902-03, at a cost of \$7,475.

Some work was also done by day labour, which consisted in placing a wheel guard all around the wharf, at a cost of \$304.47. In order to extend the government's ground in the vicinity of the wharf, which had been found too narrow to accommodate the great number of vehicles at the time of arrival and departure of the boat, a tract of land was purchased for the price of \$250.

The expenditure for the fiscal year ended June 30, 1903, was \$7,407.83.

## ST. SIMEON.

At St. Siméon, in the county of Charlevoix, the repairs of the isolated block undertaken last year, have been completed.

The eastern face has been sheathed with spruce 10 by 10 inches, and 25 feet long. The other faces were repaired by closing holes existing in the face timbers, and replacing the pieces of sheathing broken.

The stairway, which had been badly damaged, has been thoroughly repaired. Spring tides rise 19 feet, neap tides rise  $12\frac{1}{2}$  feet.

The expenditure for the fiscal year 1902-03 amounted to \$598.92.

## TABLEAU (DESCENTE DES FEMMES).

Tableau (Descente des Femmes), is a new settlement on the north side of the River Saguenay, about 61 miles from its mouth. In view of aiding the colonization of that portion of the Saguenay, which has no other communication than by water, the sum of \$5,000 was voted at the session of Parliament of 1902 for the construction of a wharf.

During the fiscal year 1902-3 a block, 40 feet in length by 30 feet in width, with a return of 30 by 25 feet, and two piers of 20 feet in length by 25 feet, placed 25 feet from the block and from each other, were commenced. The outer block was sunk in 18 feet of water at low water spring tides, and stands 41 feet high. The block and the return are built of close-face timber, the piers are built of round logs open-face, and intended to be sheathed.

Spruce and tamarack timbers were used; the structure is ballasted with stones on its full height.

Spring tides rise 18 feet; neap tides, 11 feet.

The work was done by day labour at a cost of \$5,035.71.

## TADOUSAC WHARF.

Tadoussac, or l'Anse à l'Eau, the chef-lieu of the County of Saguenay, is a well-known watering place, on the north-eastern side of the Saguenay river, about 5 miles above its mouth, which is much frequented by tourists and health-seekers during the summer season. The village contains three churches, one of which is the oldest church built in Canada, having been erected in 1747, four hotels and stores, a telegraph



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office, post office and many handsome villas; a fish hatchery has also been established here by the Department of Marine and Fisheries. Population of the parish, 2,500.

Some 50 years ago, or more, the lumbering firm of Price Brothers & Co., of Chicoutimi, built at Anse à l'Eau, which constitutes the harbour of Tadousac, a wharf for their own use and convenience, of round logs and slabs, and partly faced the same with square timber and ballasted the work with stone. This wharf had a total length of 366 feet, and a general width of 26 feet, excepting a block at the west end, which measured 4 feet by 50 feet by 29 feet in height. The depth available along its outer face at lowest water being about  $7\frac{1}{2}$  feet. In the absence of any other landing, this wharf was not used alone by the firm who built it, but was also taken advantage of by the Richelieu Company, as well as the general public.

The structure having become too dilapidated to be of further service for the public the federal government decided to carry out the works of repairs required to permit of the wharf being used for general shipping and landing purposes as in previous years.

During the fiscal year 1902-3 the roadway of the approach was repaired. The sheathing of the two western corners of the wharf were renewed with hardwood timber; the shed repaired and painted, at a total cost of \$1,062.10.

Spring tides rise 17 feet; neap tides, 10 feet.

#### TADOUSAC—FISH HATCHERY.

During the fiscal year 1902-3 the dam of the fish pond was extended a further length of 60 feet, and the old portion sheathed with 3-inch tamarack deals; the plank walk from the wharf to the pond was repaired, and a small kiosk was built on a pier sunk in the pond, together with a plank approach thereto. The work was done by day labour at a cost of \$928.62.

#### THREE RIVERS.

The city of Three Rivers is situated on the northern bank of the River St. Lawrence, at the mouth of the River St. Maurice, 71 miles below Montreal and 68 miles above Quebec.

In the month of June, 1902, a contract was entered into with Mr. Randolph MacDonald, of Toronto, for the construction of a deep water wharf with a mooring face of 1,968 feet on the river side, with a return of 24 feet to connect the lower end of Dean's wharf.

The contract includes the construction of an ice-breaker built of timber cribwork at the upper end of the wharf, as a protection against the effects of the ice. The ice-breaker is 50 by 100 feet and 53 feet high, or 23 feet above low water.

At the end of the fiscal year part of the foundation for the ice-breaker had been excavated and the bottom of the timber structure had been built to a height of 11 feet; nothing had been done towards the construction of the wharf proper, except delivering part of the timber.

The expenditure during the fiscal year was \$49,914.21.

### PROVINCE OF ONTARIO.

#### ALGOMA MILLS.

Algoma Mills is situated on the north shore of the north channel of Lake Huron, in the district of Algoma, and is a station on the Canadian Pacific Railway. An extensive lumbering business is done at this place. Some 75,000 tons of coal are annually shipped to this harbour by boat.

On May 8, 1902, authority was given to dredge the channel in order to allow vessels to load and unload at the pier. The plant of Messrs. Eddy Brothers, Blind River, was



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engaged to do the work required, and it was all completed between May 12 and June 10 of the same year. The dredge removed 10,780 cubic yards of material.

The expenditure for the fiscal year was :—

Paid Eddy Brothers for use of plant, dredging . . . . .	\$2,118 00
“ Inspector’s wages . . . . .	98 00
	<hr/>
	\$2,216 00

## BARRIE.

Barrie is situated in the county of Simcoe, 66 miles north-west from Toronto, on Kempenfeldt bay, Lake Simcoe. Population, 5,600.

At the last session of parliament, the sum of \$3,000 was appropriated for the construction of a wharf at that place, and authority was given to do the work by days’ labour. At the end of the fiscal year part of the lumber for this structure had been purchased.

Expenditure for the fiscal year 1902-3, \$1,165.30.

## BAYFIELD.

Bayfield, a village in the county of Huron, is situated at the mouth of the river of the same name, which empties into Lake Huron 12 miles south of the town of Goderich. It contains one grist and sawmill.

On November 27, 1901, a contract was let to Mr. James Clark, of Goderich, to construct an extension to the south pier, 120 feet in length, 30 feet wide, and to dredge berths for the cribs to 16 feet below low water. Active operations were not commenced until July, 1902, and the first crib was not placed in position until the middle of October, and in only about 14 feet of water. The second or outer crib was placed in later on and in a less depth, and was washed ashore by the fall storms, but afterwards towed back with the lower tier of timber torn off. On November 7, 1902, the work was ordered to be stopped for the winter. Nothing further has been done in the way of delivery of material, or work performed since the date above mentioned.

Expenditures for the fiscal year 1902-03: Paid inspector’s wages, \$366.55.

## BIG BAY.

Big Bay is situated in the county of Grey, at the entrance of Colpoy bay, on the Georgian bay, about 15 miles north of Owen Sound harbour. There is a small village at this place and the trade is a limited one in timber, cordwood and poles.

At the last session of parliament the sum of \$5,000 was appropriated for repairs to the wharf at Big Bay, and on June 19, 1902, authority was given to expend the amount and to do the work by days’ labour. Owing to the difficulty in obtaining labour, operations were not commenced until October, and the work was finished in November. It consisted in replanking the deck of the wharf a length of 355 feet, renewing stringers, &c., where required. Some 22,000 feet B.M., 3-inch beech plank, 1,500 feet B.M., pine and 780 lbs. iron bolts and spikes were used.

Expenditure during the fiscal year 1902-03, \$467.94.

## BLIND RIVER.

Blind river is a village situated on the north shore of the north channel, Lake Huron, in the district of Algoma. It is a station on the Canadian Pacific Railway. Extensive lumbering operations are carried on at this place.

On February 11, 1903, a contract was let to Mr. Robert Grant, of Toronto, to construct a pile wharf, 450 feet in length, 20 and 30 feet wide, with a stone and gravel



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approach 150 feet in length, 20 feet wide on top. Work was commenced in April, and it is expected that the structure will be all completed in July.

Expenditure for fiscal year 1902-03, \$5,364.54.

## BOWMANVILLE.

Bowmanville, or Port Darlington, is situated on the north shore of Lake Ontario, County of Durham, 43 miles from Toronto by rail on the Grand Trunk division of the main line between Toronto and Montreal. Population, 3,500.

At the last session of Parliament the sum of \$4,000 was appropriated to complete the repairs to the breakwater at this place, and on June 19, 1902, authority was given to expend the amount appropriated, and to do the work by day labour. Operations were commenced on July 23, and were continued until November, 1902, when they ceased for the winter months, and were resumed in May, 1903. The work consists in rebuilding the superstructure of the breakwater, or the western pier, from low water up, a distance of 200 feet; also placing stone ballast in the cribwork of the eastern pier where required. In doing the above work some 97,867 feet B.M. pine, 680 lbs. iron and 57 toise stone were used.

Expenditure for fiscal year 1902-3, \$4,009.07.

## BRONTE.

Bronte is situated in the County of Halton, on the north shore of Lake Ontario 27 miles south-east of Toronto.

At the last session of Parliament the sum of \$3,000 was appropriated for harbour improvements at Bronte, and on June 19, 1902, authority was given to expend this amount and to do the work by day labour. Operations were not commenced until August 7, owing to the difficulty in obtaining materials and labour. The work consists in building one crib on the outside end of the south pier 42 feet long, 16 feet wide and 9 feet deep, sunk on old crib bottom filled with stone, built of hemlock to the top of low water. Superstructure built on the south pier 265 feet in length, 2 feet high and 16 feet wide; 150 feet 2 feet high and 20 feet wide; 200 feet 2 feet high and 18 feet wide; built of white pine and filled with stone. Superstructure on outside end of east pier, 50 feet long, 4 feet high and 24 feet wide, built of white pine, filled with stone and decked. Superstructure on inside end of east pier, 40 feet long, 2 feet high, 24 feet wide; 100 feet 1 foot high and 24 feet wide, built of white pine and filled with stone and gravel, not decked.

In doing the above work the following material was used:—42,983 feet B.M. of pine lumber; 13,088 feet B.M. of hemlock; 2,860 feet B.M. of elm; 71 toise of stone; 2,894 lbs. of iron.

Expenditure for the fiscal year 1902-3, \$3,050.01.

## BRUCE MINES.

Bruce Mines is situated in Algoma district, on the north shore of Lake Huron, 45 miles south-east of Sault Ste. Marie.

The dredging of a basin in front of the government wharf at this place, ordered on April 10, 1903, and for which purpose Mr. C. S. Boone's dredging plant was engaged, commencing work on April 24, was completed on July 23 of the same year.

On August 12 authority was given to provide 5 buoys to mark out the channel and basin in front of the wharf.

Expenditure for fiscal year 1902-3, \$5,159.



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## BURK'S FALLS.

Burk's Falls is situated in the district of Parry Sound, on the Magnetawan river and is a station on the Grand Trunk Railway, Northern Division. Population, 1,500.

During the session of Parliament of 1902 an appropriation was voted for the construction of a wharf at this place, and on January 2, 1903, a contract was let to Mr. David Conroy to build a structure of pile trestle work, 300 feet in length and 25 feet in width. The work was commenced, but had not been completed at the end of the fiscal year.

Expenditure for fiscal year 1902-3, \$4,497.74.

## BURLINGTON CHANNEL.

Burlington channel, in the County of Wentworth, is simply a cut through a piece of low land which partly separates Lake Ontario from a large sheet of water called Burlington bay, enabling vessels to reach the wharf at the city of Hamilton. Both sides of the canal are lined with piers.

At the last session of Parliament the sum of \$50,000 was appropriated, in addition to \$45,000 of the previous year, for repairs to the piers at Burlington channel and a contract was let on October 10, 1901, to Mr. James Clark, of Goderich, to reconstruct the superstructure of the west end of the south pier, and to protect the channel sides of both piers with sheet piling. Operations were not commenced until June, 1902 and up to December 9, when the contractor discharged all his men and stopped the work, only 36 per cent of the work had been accomplished. Work was again resumed in March, 1903, and by the end of the fiscal year not more than 43 per cent of the contract had been accomplished. No timber has, so far been obtained for rebuilding the superstructure of the west end of the south pier.

The swing bridge staff were employed from July 1 to December 19, 1902, when the lights were put out, and navigation ceased for the season, opening again in April, 1903 when they resumed duty. The auxilliary storage battery for operating the bridge is being installed.

The expenditure for the fiscal year 1902-3 was \$42,758.34.

## CALANDER.

Calander is situated on Eastern bay, Lake Nipissing, in the district of Algoma, some 8 miles south of North Bay.

At the last session of parliament the sum of \$1,500 was appropriated for repairs to the wharf at this place, and authority to expend the same was given on June 19, 1902. The work consisted in repairing with pile bents, caps, stringers and flooring the shore end of the wharf, a distance of 300 feet.

In doing the above work some 25,422 feet B.M. white pine, 20,587 feet B.M. Georgian pine and 12,000 lbs. iron bolts were used.

Expenditure for fiscal year 1902-03 :—

Materials, lumber, iron, &c. . . . .	\$1,098 07
Superintendence and labour . . . . .	361 40
	<hr/>
	\$1,459 47

## CHANTRY ISLAND.

Chantry Island, Southampton, is situated about 1½ miles west-south-west from the mouth of the Saugeen river, Southampton in the county of Bruce, North riding.

During the session of parliament of 1902, the sum of \$3,300 was appropriated for repairs to the breakwater at this place. Work was commenced on July 3, 1902, and completed on November 29 of the same year. The repairs executed consisted chiefly in sheathing the outer or northern side of the breakwater a length of 280 feet.



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In doing the above work some 33,181 feet B.M. hemlock, 69,610 feet B.M. cedar, 27,614 feet B.M. pine, 4,600 lbs. iron bolts and spikes, and 27 cords of stone were used.

Expenditure for fiscal year, 1902-03:—

Materials, lumber, iron and stone. . . . .	\$2,328 00
Labour and superintendence . . . . .	972 00
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	\$3,300 00

COBOURG.

Cobourg is an incorporated town of Ontario in Northumberland county, situated on the north shore of Lake Ontario, on the Grand Trunk Railway, 92 miles west by south of Kingston, 69 miles north-east of Toronto, and is a port of entry. It has several mills, foundries, breweries and a car factory. Population, 4,239.

At the last session of parliament the sum of \$10,000 was appropriated for repairs to the piers and dredging at Cobourg, and on June 19, 1902, authority was given to expend \$2,000 and on August 16, a further sum of \$2,000, in all \$4,000, by days' labour, to repair the centre pier and the Langevin pier. Work was commenced on July 7, and completed on September 24, 1902. It consisted in replanking and placing in new stringers where required on both piers.

In doing the above work, some 107,750 feet B.M., of cedar plank, 3,147 feet B.M., pine timber, 6,115 lbs. of iron bolts and spikes, and 52 toise of stone were used.

Expenditure for fiscal year 1902-03:—

Labour and superintendence . . . . .	\$1,122 77
Materials, lumber, iron and stone. . . . .	2,876 68
	<hr/>
	\$3,999 45

COLLINGWOOD.

Collingwood is situated on the south side of the Georgian bay, township of Nottawasaga, county of Simcoe, 94 miles by railway from Toronto. It is the terminus of the Northern and Hamilton and North-western railways. There is an extensive trade in shipbuilding, grain and lumber and it is the starting point of steamers for Owen Sound, Sault Ste. Marie, Parry Sound, &c. Population, 9,000.

As constituted now the harbour is very large and commodious, being protected on the north and east sides by extensive breakwaters. Several small wharfs belonging to the town or to companies are built inside the area inclosed by these breakwaters.

During the session of parliament of 1902 an appropriation was voted for improvements in Collingwood Harbour. On August 29, 1902, a contract was let to Mr. C. S. Boone, of Toronto, to deepen the outer end of the entrance channel to 20 feet at low water, a width of 90 feet, which gives, with the 110 feet already deepened, a width of 200 feet. Work was commenced during the season of 1902, and by June 30, 1903, the plant had nearly completed the contract which calls for the removal of 26,277 cubic yards. Mr. Boone's plant removed 408 cubic yards of rock from the side of elevator, also 32,582 cubic yards of material from the harbour channel to Messrs. Charlton's mills.

Expenditure for fiscal year 1902-03, \$85,129.24.

CORNWALL.

Cornwall, the chief town of the united counties of Stormont, Dundas and Glengarry, is situated at the mouth of the Cornwall Canal, on the River St. Lawrence, on the line of the Grand Trunk Railway, 67 miles south-west of Montreal, and 105 miles east of Kingston. It is a port of entry. The Cornwall Canal gives it excellent water privileges, which are taken advantage of by several large mills and factories erected on its banks, among them two cotton mills, two woollen mills, two grist mills, one saw-



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mill, three planing mills, and one sash and door factory. The town contains Episcopal, Roman Catholic, Presbyterian and Methodist churches, an agency of the Bank of Montreal and of the Ontario Bank, two telegraph offices, two printing offices from which weekly papers are issued, eight hotels, and about one hundred stores.

In order to accommodate the growing traffic by water, an old wharf, called the 'up river wharf,' situated on the Crown land opposite the canal bridge at the foot of Augustus street, on the River St. Lawrence, which was extremely dilapidated, was removed to 1 foot below the extreme low water level and rebuilt on a height of 5 feet and a length of 152 feet and 10 feet wide; at the down-stream end an extension 75 feet long, 10 feet wide and 13 feet high was built and sunk in 8 feet at low water; a return wing 66 feet long, 10 feet wide, was built to the shore; the whole well ballasted with stone.

The wharf is parallel with the shore, and has a total length of 227 feet, by a height of 13 feet, and stands in 9 feet at low water, with an ice-breaker at its up-stream end. The outer face is built with close-faced timber, 12 by 12 inches, laid to a batter of 1 in 12. The corners are protected with steel boiler plates  $\frac{3}{8}$  inch thick.

The top is planked over for a width of 12 feet from the outer face of the wharf and the space between that floor and the shore has been filled in on the whole length to the level of the wharf with dredged materials, on which has been put a layer of gravel.

A store house 12 by 18 feet has been erected on the wharf, and the road from the bank of the canal has been improved and put in good condition.

Dredging has been performed in front of the wharf on a length of 300 feet by a width of 24 feet on a depth of 4 feet.

The work, carried out by day labour, was commenced in May and completed in June, 1903.

Cost of construction . . . . .	\$3,841 92
“ dredging . . . . .	960 00
Total cost . . . . .	<u>\$4,801 92</u>

## DEPOT HARBOUR.

During the session of Parliament of 1902 a sum of \$65,000 was revoted to be applied towards the construction of an additional length to the elevator wharf. The proposed extension to be 1,250 feet long, 60 feet wide, built outwards from the end of the present elevator wharf towards Supply island. The above work is comprised in a contract dated May 14, 1902, for a total sum of \$195,000.

During the fiscal year changes were made at the request of the Canada Atlantic Railway Company in the location and the general lines of the works, consisting in the extension of the elevator wharf for a length of 525 feet, 80 feet in width, and the construction of a landing pier 400 feet in length, 150 feet in width, in the innermost portion of the harbour.

These changes were accepted by the contractors under their former contract, and the work connected therewith may be summarized as follows:—

1st. *Extension*.—To consist of cribwork walls forming the sides and outer end of the work with filling between them; in substructure, the work to be built in six cribs; cribs Nos. 1 and 2, 200 feet long by 30 feet wide; cribs Nos. 3 and 4, 150 feet long by 40 feet wide; cribs Nos. 5 and 6, 175 feet long by 40 feet wide; built up to the level of one foot above extreme low water level; the whole work to rest on an artificial stone foundation.

In the superstructure the work to be built of continuous cribwork walls 12 feet wide, carried up from the top of separate cribs to a height of 7 feet above extreme low water.

2nd. *Landing Pier*.—To consist of cribwork walls, forming the sides and outer end of the work, with filling between them, and a stone embankment to connect with the shore.



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The substructure to be built in five cribs; cribs Nos. 1, 2, 3 and 4, 200 feet long by 30 feet wide; crib No. 5, 90 feet long, 30 feet wide, built up to a level of 1 foot above extreme low water; the whole work to rest on an artificial stone foundation.

Superstructure to be built of continuous cribwork walls, carried up from the top of cribs to a height of 7 feet above extreme low water.

Some dredging required in the construction of the landing pier is to be performed by the department dredges, and is not included in the contract.

During the last fiscal year a large portion of the artificial foundation of stone of the extension was built, and cribs Nos. 1 and 3 of the extension were built, sunk in place and fully filled with stone ballast. A large quantity of materials of construction were also delivered on the works.

The expenditure for the fiscal year 1902-3 was \$30,919.89.

#### GODERICH.

Goderich, in the county of Huron, is situated on the east shore of Lake Huron, at the mouth of the river Maitland about 68 miles from Sarnia, and 60 miles from London.

It is the terminus of the Buffalo branch of the Grand Trunk Railway, and a place of considerable importance.

The reconstruction of the superstructure of, or repairs to the commercial dock, which is 675 feet long, was undertaken towards the end of May, 1902, and completed in the early part of September, although the whole work done under the appropriation 'Repairs to Piers and Docks,' was not completed until October 9, the work necessarily being slow, it not being advisable to dismantle too much of the dock at once, so as not to interfere with the traffic, and also on account of frequent interruptions caused by trains and vessels.

These renewals and repairs cost \$5,979.80, including the removal of some logs and stumps that had found their way into the deepened basin of the inner harbour.

#### HAILEYBURY.

Haileybury, a post village in Nipissing county, is situated on the west shore of Lake Temiscamingue, near the entrance into Wabi bay.

In the fiscal year 1900-1 the construction of a wharf was commenced to accommodate the local trade. When completed this wharf will have a close-pile head, 50 feet square, filled with stone, built in 8 feet of water, and connected with the shore by an approach built of stone and earth, 560 feet long, 15 feet wide on top of roadway.

No work was done on this structure during the fiscal year 1901-02.

During the fiscal year 1902-03 work on this wharf was resumed and some progress made with the construction of the approach, which is, however, not yet completed.

Expenditure during the past fiscal year, \$3,753.98.

Total expenditure to June 30, 1903, is \$5,754.20.

#### HARWOOD.

Harwood is situated on Rice lake, county of Northumberland, 30 miles to the north of Peterborough.

At the last session of parliament the sum of \$1,000 was appropriated for completing the construction of a wharf at this place, and on June 19 authority was given to expend the amount. The work was ordered to be done by days' labour on May 26, 1903, and was completed in June; it consisted in building a wharf of pile bents, with stringers and flooring a length of 120 feet, with a stone and gravel approach at the shore end 60 feet long.

In doing the above work some 1,570 feet B.M. oak; 6,500 feet B.M. pine; 5,431 feet B.M. cedar; 41 oak and tamarack piles; 236 lbs. iron and 130 cubic yards stone were used.

Expenditure for fiscal year 1902-03, \$999.40.



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## HILTON.

Hilton, a small village in the county of Algoma, is situated on the north shore of St. Joseph's Island, in the north passage of Lake Huron, 5 miles from Stobie, on the Canadian Pacific Railway. It contains three churches, two stores, one hotel and two mills. The sum of \$1,500 was appropriated for repairs to the wharf at this place. Work was commenced on August 26, 1902, and completed on June 30, 1903, and consists in renewing the old portions of the pier 100 feet by 100 feet from low water up; repairing and filling in with gravel the approach, and also a row of face timbers on the outer block.

In doing the above work some 2,700 feet B.M. pine; 30,800 feet B.M. hemlock; 3,200 feet B.M. tamarack; 4,956 feet B.M. cedar; 21 loads of gravel and 3,277 lbs. of iron were used.

Expenditure for fiscal year 1902-03:—

Labour and superintendence. . . . .	\$ 555
Materials, lumber, iron, &c. . . . .	945
	<hr/>
	\$1,500

## HUNTSVILLE.

Huntsville is situated on the Muskoka river, 34 miles north from Gravenhurst, in the district of Muskoka. The chief trade is lumber. Population, 1,000.

At the last session of Parliament the sum of \$5,500 was appropriated for the purpose of building a wharf at this place, and on August 22, 1902, a contract was let to Mr. George Hutcheson to construct the wharf, composed of pile trestlework, 200 feet in length and 24 feet wide, for the sum of \$2,770. Work was commenced in April, 1903, and the wharf was completed in June the same year. In order to give a better approach to the wharf, the shore was extended, costing \$320.

Expenditure for fiscal year 1902-3, \$3,396.03.

## KINCARDINE.

Kincardine, in the County of Huron, is situated at the mouth of the Penetangore river, which empties into Lake Huron, 31 miles south of Southampton. It is the terminus of the Wellington, Grey and Bruce Division of the Grand Trunk Railway. Extensive salt deposits are found here.

At the last session of Parliament the sum of \$4,000 was appropriated for repairs to the piers and dredging at Kincardine, and authority was given on June 19, 1902, to expend the sum of \$2,500 upon the repairs by day labour. A further sum of \$1,500 was authorized on September 10 for the repairs. Work was commenced on July 1, 1902, and continued to June 30, 1903. The work consists in renewing 450 feet of the eastern end of the north pier from low water up.

In performing the above repairs some 38,778 feet B.M. fir; 1,020 feet B.M. oak; 11,356 feet B.M. cedar; 22,252 feet B.M. hemlock, and 6,000 lbs. iron bolts and spikes were used.

Expenditure for fiscal year 1902-3, \$4,036.71.

## KINGSVILLE.

Kingsville, County of Essex South, on the north shore of Lake Erie, about 25 miles east of the mouth of the Detroit River, Essex and Lake Erie Railway. Population, 1,537.

At the last session of Parliament an appropriation was voted for repairs to the breakwater, also to build an extension to the same, and to repair the pier at Kingsville. On June, 19, 1902, authority was given to expend \$5,000, and on December 12 a further



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sum of \$4,000, in all \$9,000, to do the work by day labour. Operations were commenced on July 1, 1902, and completed in June, 1903. The work consisted in the completion of an extension of the breakwater over the bar, 400 feet in length, and completing the reconstruction of the shore end of the breakwater. A large quantity of the timber and stone for the work was obtained last year, so that since July 1 only the following has been purchased, viz.: 2,239 lbs. of iron, 7,14 cords of stone, and 25,000 feet B.M. of oak

The expenditure for the fiscal year 1902-3, \$8,983.23.

## MEAFORD.

Meaford is an incorporated town in the County of Grey, on the west side of Georgian bay, 18 miles west of Collingwood, and 20 miles to the eastward of Owen Sound. It is the terminus of the Northern Division of the Grand Trunk Railway. Population 2,500.

During the session of Parliament of 1902 the sum of \$30,000 was appropriated for dredging and other improvements to this harbour. On June 15, 1900, a contract was let to Mr. M. A. Piggott, of Hamilton, to construct 930 feet of close piling on the south-east side of the harbour, extending from the east abutment of the road bridge, in a north-easterly direction, to the east pier; the extension of the east breakwater 300 feet in length, and dredging to 20 feet at low water an area in the harbour to accommodate large-sized vessels, and the removal of 100 feet from the outer end of the western pier. The amount of Mr. Piggott's tender was \$62,570.

On July 19, 1901, authority was given to substitute iron piles and wooden breast work in lieu of the close-pile protection work called for in the contract, and an extra allowance for the same, amounting to \$4,914, was granted to the contractor.

Owing to inadequate plant and want of material to carry on the work, the contract was not completed until July, 1903.

On July 4, 1902, authority was given to dredge on the west side of the harbour, to enable large vessels to turn in the basin, and Messrs. Rodgers & O'Brine's plant was engaged to do the work, and operated from August 4 to 20 of the same year, removing 10,500 cubic yards of material.

Instructions having been given on August 13, 1902, to remove only 29 feet of the outer end of the western pier, instead of 100 feet as called for in the contract; but the contractor having removed his plant and men from the place, asked to be relieved from performing the work, and it was done by day labour, at a cost of \$992.11.

On December 19, 1902, authority was given to expend \$7,000 to repair the west pier, and active operations were commenced at once; the whole of the superstructure of the shore end, a length of 388 feet, has been renewed, and the approach, 200 feet in length, graded. In doing the above work 139,582 feet B.M. of cedar, 9,369 feet B.M. rock elm, 300 cubic yards of stone, and 5,300 lbs. iron were used.

A portion of the breakwater superstructure was also repaired, in which some 42,696 feet B.M. were used.

The expenditure for the fiscal year 1902-3 was \$25,157.12.

## MIDLAND.

Midland, Simcoe county, is at the terminus of the Midland division of the Grand Trunk Railway, on Georgian bay. Population, 3,500.

Large quantities of lumber are shipped to and from this harbour, and the railway company has two large grain elevators at this place. During the past two years the Canadian Iron and Furnace Company has erected large smelting works.

At the last session of parliament the sum of \$8,000 was appropriated for dredging at Midland, and on June 23, 1902, authority was given to continue the dredging in the harbour by the Owen Sound Dredge and Construction Company's plant, which was commenced by them last year. Work was resumed on June 30. By September the whole



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of the appropriation had been expended, and authority was given on the 13th of that month to continue the work, which was accordingly done, and the plant has worked up to June 30, 2,470 hours at \$10 per hour, dredging and removing 111,478 cubic yards of materials.

Expenditure for fiscal year 1902-03, \$23,759.44.

## NEWCASTLE.

Newcastle is situated in the county of Durham, on the north side of Lake Ontario, 47 miles east from Toronto. Population about 1,000. It contains large woollen mills, a tannery and implement factory.

At the last session of parliament the sum of \$5,000 was appropriated for repairs to the piers at this place, and on June 19, 1902, authority was given to expend the amount appropriated and to do the work by days' labour. Operations were commenced on July 18, 1902, and were continued until the end of November, when they ceased for the winter months, and were resumed in May, 1903. The work consisted in rebuilding the superstructure of the east, or landing pier, and repairing the substructure where necessary.

In doing the above work some 155,075 feet B.M. of pine timber; 5,373 lbs. of iron bolts and spikes, and 217 cubic yards of stone were used.

Expenditure for the fiscal year 1902-03:—

Labour and superintendence. . . . .	\$1,506 44
Materials, lumber, iron, stone, &c. . . . .	3,492 56
	<hr/>
	\$5,000 00

## OAKVILLE.

Oakville is situated on the north shore of Lake Ontario, in the county of Halton, 22 miles west of Toronto. Population about 1,700. It contains several mills and factories and a shipyard. The trade of this place is local. It is a station of the Hamilton branch of the Grand Trunk Railway.

At the last session of parliament the sum of \$4,000 was appropriated for repairs to the west pier at this place, and on June 19, 1902, authority was given to expend the amount and to do the work by days' labour. Operations were not commenced until August 11, owing to the difficulty in obtaining labour and lumber. Work practically ceased on October 22 for the winter months, as there was not sufficient lumber on hand to keep the men employed. It was resumed in April, 1903, and completed by the end of the fiscal year. The work consists in rebuilding 190 feet of the north end of the west pier, 4 feet above low water and filling same with stone, also replanking a length of 249 feet on the same pier. Constructing a crib for the outer end of the east pier 78 feet long, 24 feet wide and 16 feet high.

In doing the above work some 80,230 feet B.M. of hemlock timber; 42,718 feet B.M. of pine; 54½ toise of stone, and 4,407 lbs. of iron bolts and spikes have been used.

Expenditure for the fiscal year 1902-03, \$4,013.65.

## ORILLIA.

Orillia, in the county of Simcoe, is situated on Lake Couchiching, 89 miles north-west from Peterborough, and 23 miles north-east from Barrie. Population, 3,000.

At the last session of parliament an appropriation was voted for the construction of a wharf at this place, and on January 12, 1903, a contract was let to Messrs. Alex. Green and D. J. McKinnon, to build a structure 200 feet in length, with a width of 20 feet, consisting of cribwork substructure and concrete superstructure, for the sum of \$8,389. Active operations were commenced in April last. The work was not completed at the end of the fiscal year.

Expenditure for fiscal year 1902-03, \$3,076.33.



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## OSHAWA.

Oshawa is situated on the north shore of Lake Ontario, in the County of Ontario, 34 miles east of Toronto. Its manufactories include engines, boilers, printing and mill machinery, agricultural implements, furniture, leather and bolts and screws. Population, about 4,500.

At the last session of Parliament the sum of \$1,250 was appropriated for improvements at Oshawa harbour, and on June 19, 1902, authority was given to expend the amount by day labour. Work was at once commenced and completed in September the same year. It consisted in completing repairs to the west side of the landing pier; rebuilding coal tramway trestle; renewing sills and flooring to the grain warehouse, and placing a hoisting plant in coal elevator.

In doing the above work some 7,551 feet B.M. of pine timber, 1,863 feet B.M. hemlock; 1,192 lbs. of iron bolts and spikes, and 150 lineal feet of oak were used. The old timber, which could not be used in the repairs, was sold by public auction for \$10, and the cheque duly deposited in the Bank of Montreal to the credit of the Receiver General.

Expenditure for fiscal year 1902-3, \$1,268.20.

## OWEN SOUND.

Owen Sound, in the County of Grey, is situated at the mouth of the Sydenham river, which flows into the head of Owen Sound, an arm of Georgian bay. The town is the centre of an extensive agricultural district, and is the terminus of the Grand Trunk Railway branch of the Georgian Bay and Lake Erie Division, also of the Canadian Pacific Railway—Toronto, Grey and Bruce Division. There are several lines of steamers running to and from Owen Sound. Population, 9,500.

During the session of Parliament of 1902 the sum of \$24,000 was appropriated for dredging and pile protection work at this place.

In 1902 a contract was let to Mr. A. F. Bowman, of Southampton, to deepen and dredge on the west side of the harbour at the entrance, in order to give a larger area of harbour room, the contract being a bulk sum of \$24,210. Operations were commenced on June 30, 1902 the same being suspended on December 6, and renewed in April, 1903, up to which time the plant removed 104,001 cubic yards *in situ*.

In September, repairs were made to the sheet piling on the west side of the harbour, replacing caps, iron rods, &c.

In October the contractor deepened the Canadian Pacific Railway Company's slip, removing 4,050 cubic yards of material.

The expenditure for fiscal year 1902-3 was \$8,928.27.

## PELEE ISLAND.

Pelee island is situated on the western end of Lake Erie, in Lat. 41° 46' N., Long. 28° 45' W., about 35 miles south-east from the mouth of the Detroit river, and 16 miles south of the town of Kingsville, Essex county. Population of the island about 600. The products of the island are grapes, wine, fruit and farm produce.

At the last session of Parliament the sum of \$5,000 was appropriated for the extension of the pier at this place, and on December 15, 1902, a contract was let to A. M. McCormack & Son, to build an extension 50 feet long by 40 feet wide for the sum of \$3,500. On May 8 the contractor agreed to raise the height of the pier 1 foot for an additional sum of \$800. Work was commenced early in the spring of 1903, but was not completed at the end of the fiscal year.

Provision has been made to build a warehouse on the outer end of the pier when the extension is completed.

Expenditure for fiscal year 1902-3, \$3,600.54.



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## PENETANGUISHENE.

Penetanguishene, in the County of Simcoe, is situated on the north-eastern peninsula in Georgian bay, formed between Nottawasaga bay and the water of the Severn river, 40 miles north-west of the town of Barrie. It is the terminus of the branches of the Grand Trunk Railway, and a large quantity of lumber is shipped thence from the north and east shores of the Georgian bay.

At the last session of Parliament the sum of \$10,000 was appropriated for dredging in the harbour, and on June 23, 1902, authority was given to continue the dredging by Messrs. Bowman & Porter's plant, which was commenced by them last year. Work was resumed on June 30, 1902, and up to June 30, 1903, the plant had worked 1,278 hours, and removed 67,686 cubic yards of material.

Expenditure for the fiscal year 1902-3, \$10,076.65.

## PICKERING.

Pickering Harbour, formerly known as Frenchman's bay, is situated on Lake Ontario, 21 miles east of Toronto.

At the last session of parliament the sum of \$3,200 was appropriated for repairs to piers and dredging at Pickering, and on June 19, 1902, authority was given to expend \$600 by day labour in repairs. Work was only commenced in September, owing to the difficulty in obtaining labour and materials. The work consisted in completing the repairs to the east pier. The work was completed in May, 1903.

In doing the above work there was used some 11,256 feet B.M. of pine timber; 3,400 feet B.M. of cedar, and 505 lbs. of iron.

Expenditure for fiscal year 1902-03:—

Labour and superintendence. . . . .	\$258 07
Materials, lumber, iron, &c. . . . .	341 93
	<hr/>
	\$600 00

## POINT EDWARD.

Point Edward, Sarnia, is situated in the county of Lambton, near the head of the St. Claire river, 61 miles west of London.

At the last session of parliament the sum of \$10,000 was appropriated for dredging the channel in the St. Claire river (Point Edward), and on June 20, 1902, authority was given to employ the plant of Messrs. Muir Brothers and O'Sullivan to do the work required. Operations were commenced in April, 1903, and up to the end of the fiscal year the plant worked 448 hours and removed 35,700 cubic yards of material.

Expenditure for fiscal year 1902-03 is \$6,966.34.

## PORT COLBORNE.

The contract for the construction of the Port Colborne breakwater was awarded to Messrs. Hogan and Macdonnell on March 14, 1901, for the sum of \$395,000.

The importance of this breakwater as a protection to the commercial docks under course of construction by the Department of Railways and Canals is unquestionable. Without it these docks could not be utilized during westerly gales, which are of frequent occurrence at the eastern end of Lake Erie, and the realization of the project of making Port Colborne a transfer point for grain and merchandise for conveyance to the ports of Montreal, Quebec and all other points on the river St. Lawrence would have been impossible.

The structure as originally designed was to be 5,700 feet in length, extending from a point of land known as Sugar Loaf Point, in an easterly direction, to the 21 foot water line, and was to consist of:—



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1. A head block, all cribwork, 100 feet in length, 60 feet in width, built up to a height of 13 feet above ordinary low water level of Lake Erie (13'87 feet above the mitre sill of the new lock at Port Colborne).

2. Of 4,800 feet of cribwork, 25 feet in width, built up to an elevation of 7 feet above low water, with a break along the southern face 4 feet higher stepping down to the 7 feet level, the width of the break being 12 feet.

3. Of a stone embankment at the shore end, 800 feet in length, 25 feet in width on top, with slopes of 1 to 1½.

The construction of the cribs was commenced during the winter of 1901, but the first crib was only placed in position on August 19 of that year. Since then, however, substantial progress was made in the construction of the work, and at the end of the fiscal year 1901-02, the outer 900 feet of the structure, including the head block, were entirely completed; the adjoining 1,900 feet were built up to a height of 6 feet above ordinary low water, and 400 feet of cribwork had been sunk in position and fully ballasted, the value of the work performed during that year being \$206,300.

During the fiscal year 1902-03 the work of completing the 2,300 feet of superstructure left unfinished on June 30, 1902, was proceeded with and satisfactorily completed, and a further length of 1,200 feet of cribwork was placed in position, fully ballasted, and the superstructure built up to within two feet of the top of the work.

During construction, principally early in the spring and late in the autumn, the breakwater was severely tested by frequent and strong south-westerly gales, that it was deemed advisable to strengthen the outer end of the breakwater, and on June 23, 1902, a contract was entered into with Messrs. Hogan and Macdonnell for doubling the width of the outer 2,400 feet of the structure, the cash consideration to the contractors being \$100,000.

This work was proceeded with during the fiscal year 1902-03, and completed before the end of the year.

Subsequently, it was also deemed advisable to abandon the construction of the inner 1,300 feet of the breakwater, as it had been ascertained that the harbour would be thoroughly protected without constructing this portion of the work, and in lieu of this construction, it was decided to place a covering of concrete of an average thickness of 1½ feet on the outer 2,400 feet of the breakwater inside the break, and thereby prevent damage to the superstructure of the breakwater.

This concrete covering was satisfactorily completed before the end of the fiscal year, and has certainly proven a great success.

The total expenditure on the breakwater to the end of the fiscal year has been \$473,665, as follows:—

During the fiscal year 1901-1902 . . . . .	\$206,300 00
“ “ “ 1902-1903 . . . . .	262,666 46
	<hr/>
	\$468,966 46

This amount includes an expenditure of \$8,475 incurred in placing large stones and concrete blocks along the southern face of the breakwater, on the top of the specified slope of stone, and thereby save the southern face of the breakwater from damage by storms.

The work was completed in November, 1903.

The breakwater as constructed is 4,400 feet in length, and consists of:—

- 1st. The head block already described.
- 2nd. 2,400 feet of cribwork, 50 feet in width, partly covered by concrete.
- 3rd. 1,900 feet of cribwork, 25 feet in width.

This breakwater affords splendid protection to the entrance of the Welland Canal and to the commercial docks under course of construction, from south-westerly gales, but in order to make the harbour of Port Colborne an absolutely safe and useful harbour, it will be necessary to build a second breakwater 2,000 feet in length on the east side of the entrance to the canal.



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## PORT ELGIN.

Port Elgin is in the electoral division of the southern portion of the county of Bruce, on the eastern shore of Lake Huron, about 24 miles north of Kincardine, and 4 miles south of Southampton. It is a station of the Wellington, Grey and Bruce division of the Grand Trunk Railway. There is no track from the railway to the harbour. Population, 2,000.

At the last session of parliament the sum of \$5,000 was appropriated for an extension of the breakwater, repairs to the landing pier, and dredging at Port Elgin, and on June 13, 1902, authority was given to expend the amount appropriated, but as there was an outstanding account of \$1,500 to be paid for dredging done last year, authority to expend an additional sum equal to that amount was given on November 25, in order to complete the breakwater extension of the breakwater.

Work was commenced in July, 1902, and continued until June 30, 1903, and consisted in extending the southern end of the breakwater a distance of 210 feet, viz.: 2 cribs 15 by 60 feet, 1 crib 20 by 60 feet, and 1 crib 30 by 30 feet, also repairing the landing pier from low water up, a length of 300 feet.

In doing the above work some 333 cords of stone; 12,053 lbs. iron bolts and spikes; 45,500 feet B.M. cedar; 4,601 feet B.M. beech; 115,373 feet B.M. hemlock, and 148 lbs. rope was used.

Expenditure for fiscal year 1902-03, was \$6,456.46.

## PORT HOPE.

Port Hope is situated in the county of Durham, on the north shore of Lake Ontario, 63 miles east of Toronto, on the Grand Trunk Railway, and has a population of 4,188. Chief trade is in lumber and grain.

At the last session of parliament the sum of \$5,000 was appropriated for repairs to the piers at Port Hope, and on June 19, 1902, authority was given to expend the amount appropriated, and to do the work by days' labour. Operations were commenced on July 1, and continued until November, when the work was suspended for the winter months, and resumed in May, 1903. The work consists in renewing the superstructure of the outer end of the east pier a length of 180 feet, and shore end of the same 240 feet in length.

In doing the above work the following materials have been used, viz.: 124,300 feet B.M. of pine timber and 997 lbs. of iron bolts and spikes.

Expenditure for the fiscal year 1902-03, \$5,017.45.

## PORT ROWAN.

Port Rowan, Norfolk county, is on the north shore of Lake Erie, in the inner bay of Long Point, and is 21 miles from the town of Simcoe.

On January 5, 1903, authority was given to expend the sum of \$275, which was afterwards supplemented with \$100 more, to make the necessary repairs to the landing pier and its approach, at this place. Work was commenced in May and completed in June, 1903. It consists in rebuilding 440 feet in length of the riprap stone wall of the approach on the east side, and repairing the west side where required; replanking and replacing in new stringers at the outer end of the pier.

In doing the above work, some 150 cubic yards of stone were replaced; 3,028 feet B.M. of pine timber; 852 feet B.M. of oak; 7 loads of pine brush and 4 loads of gravel were used.

Expenditure for fiscal year 1902-3:—

Materials, lumber, gravel, stone, &c. . . . .	\$142 24
Labour and superintendence. . . . .	121 95
	<hr/>
	\$264 19



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## PORTSMOUTH.

Portsmouth, is situated on the north shore of Lake Ontario, County of Frontenac, on Portsmouth bay, 2 miles from Kingston. Population 1,700.

At the last session of Parliament, the sum of \$500 was appropriated to complete the repairs to the pier at this place, and on June 19, 1902, authority was given to do same by days' labour. Work was commenced on July 25, and completed on August 31. The work consisted in levelling up the outer end of the pier, which had subsided, and in repairing the approach.

In doing the above work, some 9,600 feet B.M. of timber and plank, and 1,948 lbs. of iron were used.

Expenditure for the fiscal year 1902-3, \$516.50.

## PORT STANLEY.

Port Stanley is on the north shore of Lake Erie, at the mouth of Kettle creek, in the County of Elgin, about 85 miles west from the entrance of the Welland Canal, and 8 miles south from the city of St. Thomas, and is the terminus of the Lake Erie and Detroit River Railway. Population about 1,000.

At the last session of Parliament the sum of \$14,000 was appropriated to complete repairs to the piers and for dredging at this place. On June 19, 1902, authority was given to expend \$5,000 to carry on the repairs by day labour, and on December 12 an additional amount of \$5,200 to complete same. Operations were at once commenced, and in June, 1903, the appropriation had been expended. The work consists in thoroughly protecting the outer end of the west pier and the reconstruction of the superstructure of the shore end of the east pier, a length of 450 feet from low water up.

In doing the above work some 104,750 feet B.M. of pine timber, 33,370 feet B.M. of cedar, 8,527 feet B.M. of oak,  $4\frac{1}{2}$  cords of stone, 200 feet of  $\frac{3}{4}$ -inch wire rope, 31,651 lbs. of iron bolts and spikes, 55 oak piles 36 to 40 feet long, and 23,000 feet B.M. of hemlock have been used.

Expenditure for the fiscal year 1902-3, \$10,267.79.

## RICHARD'S LANDING.

Richard's Landing is situated at the north-eastern end of St. Joseph's island, in the District of Algoma.

The sum of \$1,500 was authorized to be expended for repairs to the wharf at Richard's Landing. Work was commenced on July 18, 1902, and completed on November 10 the same year, and consisted of general repairs to the wharf, renewing the greater part of the structure from low water up, replanking same, building an entirely new approach of trestlework and a warehouse.

In doing the above work some 20,500 feet B.M. hemlock plank, 10,725 lineal feet hemlock, 380 feet B.M. cedar, 100 feet B.M. birch, 10 M. shingles, 2,300 feet B.M. pine, 1,297½ lbs. iron were used.

Expenditure for the fiscal year 1902-3, \$1,498.46.

## RONDEAU.

Rondeau is situated in the County of Kent, at Pointe aux Pins, on the north shore of Lake Erie, about 140 miles west of Port Colborne, the Lake Erie entrance to the Welland Canal. It is a harbour of refuge, and a very important one on this side of the lake. Of late years the beach at Rondeau has become a much frequented summer resort, and many cottages have been erected. The Erie and Huron Railway have constructed their line this far, and have established a dock for lake ferry to deliver coal in cars from the other side.

At the last session of Parliament an appropriation was voted for repairs to the piers and dredging at this place, and on June 19, 1902, authority was given to expend



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\$7,000 to carry on the repairs by day's labour. Operations had been commenced in April, 1902, and were completed in June, 1903. The work consisted in completing the reconstruction of the superstructure of the eastern pier, at the northern end, a length of 730 feet, also rebuilding the superstructure of the breakwater on the east side of the harbour, a length of 338 feet.

In doing the above work some 95,071 feet B.M. pine, 14,400 feet B.M. fir, 8,670 feet B.M. oak; 26,800 lbs. iron were used.

Expenditure for the fiscal year 1902-3, \$10,004.75.

## SAULT STE. MARIE.

Sault Ste. Marie is situated at the head of St. Mary's river, which connects Lake Superior with Lake Huron. On November 11, 1902, authority was given to dredge in front and alongside the McKay wharf at this place, to give sufficient depth for vessels to take coal at this wharf. Work was commenced on November 10, and up to June 30, 1903, the plant of Messrs. Hickler Brothers worked 859½ hours dredging, and 19½ days drilling and blasting, at a cost of \$11,295.75. The inspector's wages amounting to \$347.

On April 3, 1903, authority was given to expend the sum of \$3,200 in repairing the wharf and approach to the same. The work performed was the entire rebuilding of the approach from low water up, a distance of 230 feet; rebuilding 11 new cribs in the old portion of the structure and replanking the deck of the entire wharf, renewing the stringers where required, also placing a protected sidewalk on the approach.

In doing the above work some 95,071 feet B.M. pine, 14,400 feet B.M. fir, 8,670 B.M. pine plank and timber, and 1,050 lbs. iron were used, placing the wharf in thorough repairs.

Expenditure for fiscal year 1902-03, \$15,407.98.

## SHEGUINDAH.

Sheguindah, Algoma district, is situated on the east end of Manitoulin Island, at the entrance to Haywood Sound, and at the western end of Sheguindah bay. The village is 6 miles south of Little Current, and 16 miles north of the village of Manitowaning.

On July 9, 1902, authority was given to expend the sum of \$200 in building a warehouse, 60 by 20 feet on the wharf at this place. Work was commenced at once, and the building completed by August 15 of the same year.

Expenditure during the fiscal year 1902-03, \$181.35.

## SOUTH NATION RIVER.

South Nation river takes its rise in the township of Matilda, in the county of Dundas, and after a very irregular course of 100 miles, enters the Ottawa river 5 miles below Plantagenet, county of Prescott. There are several large tributaries which render it almost insufficient, especially during freshets, on account of its small flowing capacity, to carry all these waters without overflowing the banks and flooding large areas of land. Apart from this, obstructions exist in the bed of the river, which impede the flow of the stream, and their removal would give a freer course to the discharge, and the flooding of the lands would be averted to a certain extent.

The most serious of these obstructions is called the 'Pitch-Off,' situated about 1½ miles above Plantagenet, and 6½ miles above the outlet of the river. It consists of a bridge of solid rock which crosses the river, almost from bank to bank, with an average width of 300 feet, and an elevation of about 4 feet above low water level. The bed of the river at this point is 400 feet wide.

Some years ago on the east side of the river, a cut 100 feet wide and 1 foot deep at low water, was made through this obstruction by the local government to drain the



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river above and to check the summer floods which caused considerable damage to crops over an area of about 10,000 acres.

During the fiscal year 1900-01 this cut was widened to 225 feet, and excavated to a depth of  $1\frac{1}{2}$  feet below low water, by removing 6,500 cubic yards of rock at a cost of \$5,017.16.

During the fiscal year 1901-02 the existing cuts were cleaned down to grade, widened to 325 feet, and excavated to grade, by removing a total of 5,200 cubic yards of rock at a cost of \$4,438.09.

During the fiscal year 1902-03 the cut was widened to 360 feet, and the whole channel was deepened to 2 feet below extreme low water, by removing a total of 1,250 cubic yards of rock.

Expenditure for the last fiscal year, \$1,002.80.

Total expenditure to June 30, 1903, \$10,458.05.

#### ST. JOSEPH.

St. Joseph is situated on the east side of Lake Huron, in the county of Huron,, about 14 miles south of Goderich. Population, 500.

During the session of parliament of 1902 the sum of \$5,000 was appropriated towards building a wharf at St. Joseph, Huron county, a large amount of materials for the work had been purchased during the latter end of the fiscal year 1901-02. Operations were at once commenced and carried on until the early part of December, 1902, when the appropriation having been expended, the work was stopped. The structure under construction is a stone embankment approach 290 feet long, and cribwork with continuous superstructure 408 feet in length, 20 feet wide. The approach is completed up to water level; 2 cribs 20 by 20 feet are in place at the end of the approach, and 8 cribs are framed ready for sinking; 234 cords of stone and 1,000 bolts 27 inches, and 785, 24 inches long, are delivered and paid for.

During the past season were purchased some 2,150 lbs. iron; 550 cords stone; 88,200, feet B.M., hemlock; 4,222 feet, B.M., pine; 2,600 feet, B.M., elm.

Expenditure for fiscal year 1902-03, \$5,042.39.

#### STURGEON FALLS.

Sturgeon Falls, a post village in the District of Nipissing, Ontario, is situated on the Sturgeon river and on the Canadian Pacific Railway, 23 miles west of North Bay.

The Sturgeon river is available for boats plying on Lake Nipissing.

At the last session of Parliament the sum of \$500 was granted to be applied towards the construction of a wharf and approaches.

On January 23, 1903, a contract was let for the construction of the wharf at the foot of Wharf lane, for the sum of \$2,810, comprising the following works:—

The wharf to be formed of four cribs sunk 20 feet apart and unitel together with platforms. The cribs to measure 30 by 20 feet (except the first crib, forming the approach, which is 20 feet square), to be sunk in 10 feet of water, in line, in a north-westerly direction, at an angle of  $80^{\circ} 17'$  with wharf line. The body of the work to form an L and built up to an elevation of 6 feet above extreme low water level. The cribwork to be built with round timber throughout, with landing faces sheathed.

The work was progressing in a satisfactory manner at the end of the fiscal year.

Expenditure for fiscal year 1902-3, \$506.54.

#### SYDENHAM RIVER.

Sydenham river has its outlet in Chenal Ecarte, the passage between St. Anne island and the mainland. From its mouth to Wallaceburg it is a large navigable stream,



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above this point it divides into two branches—north to Wilkesport 14 miles, and east past Dresden 15 miles, and on these two branches small steam crafts with scows are run, and booms of timber are rafted.

On August 21, 1902, authority was given to expend the sum of \$100 in the removal of snags and other obstructions from the Sydenham river between Wilkesport and Wallaceburg, which had been carried into the stream by the floods in July. Work was commenced on September 12, and completed by October 12.

Expenditure for the fiscal year 1902-3: Labour and superintendence, \$96.

## THAMES RIVER.

Thames river empties into Lake St. Clair, and is navigable as far as the town of Chatham.

During the session of Parliament of 1902 the sum of \$8,200 was appropriated for dredging the channel of this river from Chatham to Lake St. Clair; and on April 22, 1902, authority was given to arrange with the Chatham Dredge Company to continue the work commenced last year, in order to give an entrance channel 100 feet wide and 12 feet deep. Operations were commenced on Jun 4, 1902, and the work was completed on September 8, the same year, during which time the plant dredged and removed 35,907 cubic yards of material at 13½ cents per cubic yard=\$4,767.60, and worked 2¾ hours removing logs at \$8 per hour=\$22.

Expenditure for fiscal year 1902-3, \$8,449.77.

## THESSALON.

Thessalon is situated on the north side of the north channel of Lake Huron, in the District of Algoma, 50 miles east of Sault Ste. Marie. Considerable lumber is shipped from this place.

On August 22, 1902, authority was given to expend the sum of \$400 in building a warehouse, and in making necessary repairs to the flooring of the wharf at Thessalon. A further sum of \$100 was allowed on September 26 for repairs. The warehouse is 72 feet by 28 feet, built on cribs. All the work was completed in October of the same year.

Expenditure for fiscal year 1902-3:—

Labour and superintendence . . . . .	\$276 30
Materials, lumber, iron, paint, &c. . . . .	383 50
	<hr/>
	\$659 80

## THORNBURY.

Thornbury, an incorporated village in Grey county, is situated at the mouth of Beaver river, which empties into Georgian bay; on the Meaford branch of the Grand Trunk Railway, 8 miles from Meaford, and 19 miles from Collingwood. It contains four churches, twenty stores, two hotels, two grist, one saw, one woollen and one planing mill, two printing offices issuing weekly newspapers, and telegraph and express offices. Population, 900.

During the session of Parliament of 1902 the sum of \$4,000 was appropriated for harbour works at this place. The work consisted chiefly in dredging, and was performed by Messrs. Rodgers & O'Brine's plant, operating from August 25 until December 10, 1902, working 528½ hours and removing 34,771½ cubic yards of material. Some necessary repairs were made to the landing pier in May, 1903, costing \$507.93.

The expenditure for fiscal year 1902-3 was \$6,637.93.

## TORONTO.

Toronto harbour is situated on the north shore of Lake Ontario, and is formed by a circular bay 1½ miles in diameter, separated from the lake by a low island (formerly



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a peninsula) about 6 miles long, making a safe and well-sheltered harbour for containing a large number of vessels.

At the last session of Parliament an appropriation was voted for works at the eastern entrance, and authority was given on July 15, 1902, to apply the amount appropriated in constructing three mattress groynes to prevent erosion of the south-west end of Toronto island, extending the existing groynes, and in making general repairs to the entrance piers, &c.

On July 21, 1902, Messrs. Magann & Phinn completed their contract, for the sum of \$61,171, let to them on February 10, 1900, to extend the west pier at the Eastern Gap out into the lake a distance of 800 feet.

The groynes at the south-west end of the island were constructed, and repairs made to the west pier of the eastern channel and breakwater, from Fisherman's island to the east pier; also repairs and renewals of the deck of the breakwater from the eastern channel westward. Some 20,000 feet B.M. of plank was used for this purpose, the City Council of Toronto contributing 3,000 feet.

In constructing the groynes and making the repairs, &c., 12,996 feet B.M. of fir timber; 4,150 feet B.M. of cedar; 33,229 feet B.M. pine; 180 feet B.M. of oak; 26,329 feet B.M. of hemlock; 842 lineal feet brush mattress; 200 cubic yards of stone ballast; hardware, paint, oils, &c.—cost, \$185.65, were used.

The expenditure for the fiscal year 1902-3, \$9,139.08.

#### VICTORIA HARBOUR.

Victoria Harbour is situated in the County of Simcoe, on Matchedash bay, 10 miles west of Midland.

On October 21, 1902, authority was given to do 10 days' dredging at this place, and a further time of 10 days was ordered on December 9. An agreement was made with Messrs. Bowman & Porter to do the work required at \$80 per day of 10 hours, removing 600 cubic yards daily. The work was completed on November 26, the plant having worked 20 days, and removed 11,506 cubic yards of material. The contractors were allowed 5 hours for towing plant to and from Victoria Harbour.

Expenditure for fiscal year 1902-3: Paid Bowman & Porter, 20 days 5 hours, at \$80 per day, \$1,761.10.

#### WENDOVER.

Wendover, in the County of Prescott, is situated on the south shore of the River Ottawa, opposite North Nation Mills, a station of the Canadian Pacific Railway. The nearest railway station on the south shore is Plantaganet, distant about 8 miles.

The construction of a wharf was commenced in September, 1901. It consists of the following, viz.:—

(a) A stone embankment of a length of 160 feet from the shore by a width of 18 feet at the top, with slopes 1 in 1, and a height of 12 feet at the north end.

(b) A trestle or pile approach of a length of 342 feet from the stone embankment to the head block, by a width of 18 feet for 294 feet and a width of 60 feet for the remaining 48 feet adjacent to the head block.

(c) A head block of pilework laid at an angle of  $82^{\circ} 30'$  with the approach, of a length of 71 feet by a width of 32 feet, with a close-faced cribwork ice-breaker 37 feet by 24 feet at its up-stream end.

The wharf at its outer face has a height of 30 feet, stands in 10 feet at low stage of the water, and is 3 feet above the high-water level.

There is a floor of 34 feet in length, by a width of the wharf adjacent to the ice-breaker, and 8 feet above the low-water level, with a slip 38 feet long by 11 feet wide, sloping upwards 1 in 5 to the approach.



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A storehouse and waiting-room, 20 by 36 feet, is erected on the approach, adjacent to the inner face of the wharf, along the eastern side of the slip, and a pile ice-breaker.

Two clusters of 30 piles each, well bolted together, are placed at equal distances between the wharf and the shore, to protect the pile approach against the ice.

The wharf, though not completed, was opened for traffic in June, 1902.

During the fiscal year 1902-3 the sum of \$3,083.17 was expended to build the pile ice-breaker and one of the clusters of piles above mentioned, put on more braces on the pile approach and to raise the stone embankment.

The work is now completed, except raising the stone embankment 2 feet to the level of the wharf, and cutting down 6 feet from the top of the hill on road leading to the wharf.

The work was carried out by day labour.

The total expenditure to June 30, 1903, is \$9,596.64.

## WIARTON.

Wiarton is situated in the north riding of the County of Bruce, at the head of Colpoy's bay, about 32 miles north of Owen Sound.. It is the terminus of the Georgian Bay and Lake Erie branch of the Grand Trunk Railway.

On September 25, 1902, authority was given to expend \$1,200 in dredging in front of the Beet Sugar Company's wharf at Wiarton, in order to allow vessels to discharge cargoes at that place. An agreement was entered into with the Irwin Dredging Company to do the work required, and they were directed to do 15 days' dredging, removing 600 cubic yards per day of 10 hours. Operations were commenced on September 29, and completed on October 23, 1903.

On December 22, 1902, authority was given to expend \$700 to repair the deck of the breakwater. Operations were commenced on March 16, 1903, and the repairs completed early in June. In doing the work some 27,400 feet B.M. 3-inch cedar plank, 2,822 feet B.M. cedar lumber, and 650 lbs. iron spikes were used.

Expenditure during the fiscal year 1902-3, \$1,988.49.

## PROVINCE OF MANITOBA.

## GIMLI PIER.

Gimli is the most important Icelandic settlement on the west shore of Lake Winnipeg, and 62 miles north of the city of Winnipeg.

The work of repairs to the Gimli pier was proceeded with, and the outer 250 feet of the cribwork that had been damaged, and partly carried away were repaired; the top of the old side walls was rebuilt, and fully drift-bolted with 1-inch iron; the cribs were filled with stone, and some 4-inch tamarack sheet piling was driven all around the work and spiked to the side timbers, so as to prevent the possibility of the timbers being broken or torn apart by the action of the ice or waves.

The sum of \$3,555.58 was expended in doing the work.

## GULL HARBOUR.

The work on the extension of the Gull pier has been proceeded with. A length of 50 feet was built according to the plans adopted in doing the old work.

The wall timbers are 10 by 10 inches, the cross-ties 14 inches at the small end. The width of the wharf is 20 feet, the depth of the water at the outer end, 12 feet. The whole of the work is filled in with stone.

The expenditure during the fiscal year 1902-3 was \$2,488.44.



HNAUSA WHARF.

Hnausa is an Icelandic settlement on the west shore of Lake Winnipeg, about 52 miles north of West Selkirk, and 70 miles north of Winnipeg.

The work of extension to the Hnausa wharf was proceeded with during the last fiscal year; an addition 50 feet long to the north wing of the pier was completed.

The side wall timbers were 10 by 10 inches and the cross-ties 14 inches at the small end. It was thought advisable, to prevent any possibility of the waves and ice tearing the timbers apart, to drive 3-inch tamarack sheet piling around the outer face and end of the new work. The cribwork was also ballasted and filled to the top with stone.

Instead of the ordinary waling pieces 2½-inch by 4-inch iron straps were bolted on the sheet piling.

The sum of \$2,532.73 was expended on these works.

LAKE FRANCIS.

The Lake Francis work was proceeded with during this last fiscal year. The work of gathering the stone was started early in the fall opposite the site of the first contemplated work, that is, towards the south end of Lake Francis.

The guide piers were built, each 100 feet in length, 20 feet in width, of solid cribwork filled with stone, 4-inch tamarack sheet piling driven both at the ends and sides of the cribwork.

Most of the timber used was spruce, except the sheet piling.

The amount expended during the fiscal year 1902-3 was \$6,496.91.

SELKIRK.

Actual work of construction on the proposed extension of 300 feet of this wharf had not been commenced at the end of the fiscal year 1903, but the timber had been ordered, a considerable quantity of which was delivered.

The expenditure for the fiscal year was \$4,391.13.

PROVINCE OF BRITISH COLUMBIA.

ANDERSON AND KENNEDY LAKES.

This work is for the purpose of improving the outlets of the above lakes, the former in Alberni and the latter in Clayoquot sound, on the west coast of Vancouver island, to give easier access from salt water to the respective lakes, upon which there are a number of mineral claims under different stages of development, and it is for the purpose of enabling miners to get in their supplies by tracking up their heavy boats without breaking bulk that considerable work has now been done and is now approaching completion, with a very satisfactory result to those most concerned.

The following is the expenditure :—

<i>Anderson Lake—</i>	
Wages . . . . .	\$1,055 00
Provisions . . . . .	142 80
Material . . . . .	200 00
Transportation . . . . .	89 00
	————— \$1,486 80
<i>Kennedy Lake—</i>	
Wages . . . . .	\$1,333 87
Provisions . . . . .	216 26
Material . . . . .	454 24
	————— 2,004 39
Total . . . . .	\$3,491 19



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## COLUMBIA RIVER (ABOVE GOLDEN).

Owing to the late date at which the high water remained, it was not possible to resume the work of improvement before August 1, 1902. The work was confined to removing snags and cutting the brush and trees back from the edge of the bank between Athalmer, at the foot of Lake Windermere and the lower end of Armstrong's channel, a short distance above Golden, and to the repairs and conversion of the old dredge 'Muskrat' into a pile-driver, which were completed on September 9. From the 16th of the same month to October 4 the pile-driver and crew were engaged in lengthening the wing dams at Red Rock with the most satisfactory results, and a good channel has now been cut through a bar that was one of the worst obstacles to navigation in the river at low water. Some more mattrassing and stone protection became necessary around the shore connections of the dam at Bolt's channel. From October 10 to 18 a dam was built across a channel some six miles below Spillamacheen. This dam is 300 feet in length, with a 50-foot mattrass or shore connection at each end.

Some 350 yards of rock, 250 piles, 40 cords of wood, and 2,000 feet of bracing was taken out and piled on the bank at Cedar creek landing.

The expenditure in connection with the above work was \$7,490.54.

## COLUMBIA RIVER (ABOVE REVELSTOKE).

On October 15 operations were started on the reef immediately above the steamboat landing, some 40 miles from Revelstoke, the removal of which would give a further distance of navigable water for 10 miles.

Work was continued between this point and the head of the canyon, 7 miles above Revelstoke, until December 15.

The expenditure in connection with the above work was \$4,901.91.

## COLUMBIA RIVER (BETWEEN ARROW LAKES).

The new dredge 'Nakusp,' built for this work, was not completed until December 4, 1902, and too late for the 30 days' test as required by contract with the constructors, the Polson Iron Works, of Toronto, but, at the solicitation of the Canadian Pacific Railway Company, she was provisionally accepted, and as soon as the weather permitted, or early in March, began work and continued until compelled by the rising water in May to suspend operations.

For the fiscal year 1902-3 the expenditure is \$6,806.30.

## COLUMBIA RIVER (BELOW GOLDEN).

The work consisted of closing by dam or boom a large lateral channel below Blueberry creek to confine the log drive to the main channel. The small appropriation of \$2,000 did not admit of the first method, so there was substituted a very substantial boom, composed of six pieces of square timber, held in place by cross-blocks at intervals of 6 feet, securely bolted with  $\frac{5}{8}$ -inch bolts, the cross-section of boom being 50 by 26 inches, fastened to clumps of 8 piles, 4 deep and 2 wide, every 100 feet.

The expenditure on the above work was \$1,995.47.

## DUNCAN RIVER.

This service represents the annual clearing of the upper and lower Duncan rivers of snags, and clearing the banks of brush and projecting trees, all of which are of annual occurrence and caused by the erosion of the banks by the current during high water, and form a serious impediment to navigation during the low stage. The work is usually done in the spring, when the water is at its lowest.

For the fiscal year 1902-3 the expenditure is \$1,993.56.



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FRASER RIVER IMPROVEMENTS.

The existing works were kept in repair and the dredge 'King Edward' and the snag boat 'Samson' at their usual work, the former working at Stevenson.

The appropriation has been apportioned and expended as follows:—

Superintendence, wages, &c. . . . .	\$3,141 42
Dredge 'King Edward'—	
Wages . . . . .	\$3,535 89
Provisions . . . . .	454 47
Material . . . . .	116 20
Coal . . . . .	949 31
Contingencies . . . . .	24 83
	<hr/> 5,080 70
Snag boat 'Samson'—	
Wages . . . . .	\$1,130 00
Provisions . . . . .	187 31
Material. . . . .	57 63
Coal . . . . .	381 35
Contingencies . . . . .	15 58
	<hr/> 1,771 87
Total . . . . .	<hr/> \$9,993 99

HARDY BAY WHARF.

Hardy bay is nearly at the northern extremity and on the eastern coast of Vancouver Island. A wharf was built at this place to accommodate the residents on Quatsino Sound on the west coast, some eight miles across, and to facilitate the landing of the mails from the steamers running north from Vancouver and Victoria to Skeena river, Port Simpson, and other places.

The expenditure for the fiscal year was \$2,458.

SALMON RIVER.

This service is a continuation of the work of clearing the above river to facilitate the passage of logs cut on its upper reaches. This river empties into Shuswap lake at the station of Salmon Arm on the Canadian Pacific Railway, from which point the department has been extending the work of improvement towards its upper reaches, and a year or two hence should see all the necessary improvements completed.

The expenditure for the past year has been \$2,578.76.

Wages. . . . .	\$1,886 10
Provisions. . . . .	529 86
Material. . . . .	72 15
	<hr/>
Total. . . . .	\$2,488 11

SKEENA RIVER

The work of improvement of this river has hitherto been carried on during the fall and winter months, the men living in quarters erected for this purpose in the immediate vicinity of the work. This manner of conducting the work was practicable, but not altogether satisfactory, while the work was confined to the Kitsilas Canyon—some 80 miles above Port Essington at the mouth of the Skeena river. At the conclusion of the last fiscal year, June 30, 1902, all the work at this point had been completed, as far as was desirable or necessary, with the exception of a few ring bolts at the head of the



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canyon necessary for warping up at certain stages of the water. These ring bolts were put in this year and the improvements of the canyon seems to be adequate and meet the requirements of the steamboat men. Between Kitsilas canyon and Hazelton at the forks of the Skeena, some 80 miles, there are no less than twelve points requiring attention and to which the work for this season was confined. As the water was too high during the summer, the work contemplated was not commenced until October 8.

In this distance of 80 miles between Hazelton and Kitsilas canyon, 37 boulders were removed. The work was completed on November 5, and closed for the season.

The balance of appropriation remaining, some \$3,000, was expended in repairs to snag scow and in operations of snagging in the spring of 1903, which, with the increase in the number of fishermen and nets, is extending every year further up the river, adding materially to the duties of snag scow, but the result has been satisfactory. The steam hoist installed last year has proved a great advantage and economy in the conduct and result of the season's work.

The following is a statement of expenditure in connection with the above work:—

Wages . . . . .	\$4,277 07
Provisions . . . . .	900 27
Material . . . . .	1,498 16
Fuel . . . . .	342 59
Transportation . . . . .	392 70
Total . . . . .	<u>\$7,410 79</u>

## VICTORIA HARBOUR.

The work consisted principally in dredging done by the hydraulic dredge 'King Edward' for the purpose of filling in the James bay flats in the rear of the retaining wall, and at the same time deepening that portion of the harbour contiguous to that structure, and subsequently the services of the snag boat 'Samson' were also allowed for the removal of the pile coffer dam in front of the retaining wall. The work connected with the removal of the Tuzo rock was also continued, but not completed.

The expenditure on the above services was \$11,499.85.

## WILLIAM'S HEAD QUARANTINE STATION.

The work consisted in repairs to the trestle and the renewal of 500 feet of 4-inch cast iron pipe.

The details of expenditure in connection with the above service are as follows:—

Wages . . . . .	\$1,175 76
Materials . . . . .	581 84
Total . . . . .	<u>\$1,757 60</u>

## YUKON TERRITORY.

Mining Inspector and Recorders' offices have been erected at the following places:—

Bonanza, at a cost of . . . . .	\$3,515 35
Stewart City, at a cost of . . . . .	3,653 82
Gold Bottom " " . . . . .	3,714 09
Sulphur " " . . . . .	2,587 06
	<u>\$13,470 32</u>

A fireproof vault has been constructed at the court house at a cost of \$3,155.85.



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The foundations of the public buildings, which were giving away and thawing, have all been improved with the exception of the court house, which will have to be attended to next fall. Eave troughs and iron ladders have also been placed on the various buildings, both of which are very necessary improvements that were overlooked when the buildings were constructed in the first place.

The following statement shows the cost of maintenance and repairs in connection with the several offices paid out of Yukon Administration vote by the Public Works Department:—

Administration building .. . . .	\$42,120 31	
Court house .. . . .	12,233 55	
Police court .. . . .	5,353 62	
Departmental storehouse.. . . .	1,079 43	
	<hr/>	\$60,786 91
Mining Inspector's offices—		
Grand Forks .. . . .	\$ 1,144 00	
Clear Creek .. . . .	1,039 07	
Hootalinqua .. . . .	125 00	
Dominion Creek .. . . .	1,451 15	
Duncan Creek .. . . .	460 82	
Fortymile .. . . .	478 20	
Gold Run .. . . .	660 30	
Glacier Creek .. . . .	137 25	
Gold Bottom .. . . .	987 12	
Selkirk .. . . .	136 00	
Sulphur Creek .. . . .	789 50	
Stewart City .. . . .	664 00	
	<hr/>	8,072 41
Post Office, Dawson .. . . .	\$27,311 45	
Post office, Whitehorse .. . . .	4,771 85	
Miscellaneous expenditure .. . . .	1,367 70	
Government House .. . . .	16,536 97	
	<hr/>	49,987 97
		<hr/>
		\$118,847 29

MEMO.—Addition to the post office, Dawson, for the Telegraph Department is included in maintenance and repairs.



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## DREDGING OPERATIONS.

During the fiscal year 1902-03, dredging was done in the following places :—

## PROVINCE OF NOVA SCOTIA.

Digby Pier.	Salter's Wharf.
Intercolonial R.R. Pier.	St. Mary's River.
Intercolonial Coal Mining Co.	St. Mary's Riv. Bar Sonora.
Liverpool Bar and Channel.	Hand dredging.
Nova Scotia Steel and Coal Co. N. Sydney.	

## PROVINCE OF PRINCE EDWARD ISLAND.

Halliday's Wharf, Belfast.	Murray Harbour R.R. Pier.
Montague, Harbour and channel.	" Riv. Channel.
Murray Harbour South.	

## PROVINCE OF NEW BRUNSWICK

Cape Tormentine.	Point du Chêne.
Chipman and Brigg's Corner.	Spring Hill Chapel Bar.
Grand Lake Flats.	" Russel Bar.

## PROVINCE OF QUEBEC.

Batiscan River.	Lake Témiscamingue.
Boucherville.	Lachine.
Boucherville Island.	Lavaltrie.
Blanche Shoal.	Nicolet.
Coteau Landing.	Nicholas Island.
Chateauguay.	Notre Dame de Pierreville.
Doucet's Landing.	Papineauville.
Grenville.	Pointe Claire.
Graham.	Richelieu River.
River Jésus.	St. Maurice River.
Roberval.	Sorel.
Ship Channel.	Three Rivers.
St. Andrews.	Valleyfield.

## PROVINCE OF ONTARIO.

Adolphustown.	Kaministiquia River.
Bowmanville.	Kingston.
Collingwood.	Newcastle.
Cobourg.	Pickering.
Fort William.	Prescott.
Gananoque.	Port Arthur.
Goderich.	Port Hope.
Hawkesbury.	Rondeau.
Kingsville.	Wolf Island.

## PROVINCE OF MANITOBA.

Gypsumville.	Mouth of Red River.
White Mud River.	

## PROVINCE OF BRITISH COLUMBIA.

Columbia River.	Victoria Harbour.
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## PROVINCE OF NOVA SCOTIA.

## DREDGING AT DIGBY.

Digby, the shire town of the county of Digby, with a population of about 1,500, is beautifully situated on the south-west end of the Annapolis Basin. It is an important station of the Dominion Atlantic Railway, 67 miles north from Yarmouth, 150 from Halifax, 20 miles from Annapolis, and is also a port for arrival and departure of the daily steamers of the Dominion Atlantic Railway, plying between St. John, New Brunswick and Digby. The harbour is open at all seasons, and well protected from nearly all quarters. Previous to the present fiscal year, \$5,187.74 had been expended in improving the basin and entrance to the Digby pier; the work was continued from July 1 to July 13, 1902. During that time, the dredge 'Cape Breton' removed the further quantity of 11,760 cubic yards sand, gravel and mud, at a cost of \$538.60, or 4.58 cents per cubic yard, forming a basin 675 feet by 300 feet, and a channel 60 feet wide, 275 feet long at the side of the pier out toward deep water.

## DREDGING AT INTERCOLONIAL COAL MINING CO. PIER.

Pictou Harbour, Pictou county, is the finest on the southern shore of the Gulf of St. Lawrence, eastward of Gaspé. The valuable coal mines and stone quarries in the vicinity, and the finely settled and fertile country enhances its importance.

On the north shore of the harbour, along the declivity of a ridge, the town of Pictou, is situated, opposite which the harbour expands into three large arms, and at the heads of these are East, Middle and West rivers. Pictou is the eastern terminus of a branch of the Intercolonial railway, and of the Oxford and Pictou branch, and is 113 miles north-east of Halifax. It is well built, having many good stores, several hotels, branch banks, factories, sawmills, iron foundry and machine shop, lumber yards, marble works, stone quarries, and other industries. Here are also an academy, library, masonic hall, several churches, &c. The town has a population of about 3,500 and an extensive trade; the annual exports of coal are very large. The Prince Edward Island Navigation Company make Pictou a terminus for their steamers, and it is a place of call for other lines.

The dredging done by the department at Pictou was at several localities in the harbour to facilitate shipping, &c., improving the approaches to the wharfs, and deepening at and around them for berths. Pictou has a marine slip, with two cradles capable of hauling large vessels with skilled labour for repairs, &c.

During the fiscal year 1902-03 the Intercolonial Coal Mining Co. built a new loading pier at or near Abercrombie Point in the East river, to facilitate their increased coal shipments, where the dredge 'St. Lawrence' was engaged from October 14 to December 9, 1902, and from April 16 to June 1, 1903, improving the channel and berths at loading pier, removing 39,200 cubic yards, at a cost of 8.40 cents per yard, or \$3,294.52

## DREDGING AT INTERCOLONIAL RAILWAY PIER, PICTOU COUNTY.

The dredge 'Geo. McKenzie' was engaged in deepening the water in front of this pier from November 22 to December 9, 1902, and removed 1,440 cubic yards, at a cost of 73.89 cents per cubic yard, or \$1,064.12; the cost of towing the dredge and barges



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from River St. John included in this, and stormy weather will account for the cost per yard.

The dredge 'St. Lawrence' was engaged in completing this work from June 5 to June 20, 1903, removing 8,400 cubic yards at a cost of 4.51 cents per yard, or \$379.17.

## DREDGING AT LIVERPOOL.

The town of Liverpool, at the head of Liverpool bay, on the south-east coast of Nova Scotia, is in the County of Queen's, and has a population of about 2,500; taking in the village of Milton, 2 miles farther up the river, and where there are important sawmills, this population is increased to about 4,000. These places carry on an extensive trade with Halifax, the United States and the West Indies. Liverpool harbour is never frozen over. Spring tides rise 8 feet, and neap tides 5 feet. The dredging done in this harbour previous to the fiscal year 1902-3, by the department, was near the entrance of the River Mersey, abreast the town. A bar, over which there was but 5 feet, being reduced to give a channel 13 feet deep, 175 feet wide, and improve the harbour channel and approaches to the wharfs, a total quantity of 33,730 cubic yards of sand, silt and sawdust being removed at a cost of \$9,960.70. Filling in having taken place, the dredge 'Canada' operated on this bar from April 27 to June 30, 1902, removing the further quantity of 9,900 cubic yards of sand, silt and sawdust, at a cost of \$4,253.65, or 42.96 cents per cubic yard, and was continuing the work. During the fiscal year 1902-3 the dredge 'Canada' continued the work from July 1 to December 13, 1902, and from April 25 to June 30, 1903, removing 37,350 cubic yards at a cost of \$7,369.21, or 19.73 cents per cubic yard, and giving a channel through the bar 175 feet wide, 13 feet deep at low water spring tides, and same depth up the harbour. The entrance at the Marine slip was also dredged, the work being continued at the close of the year.

## DREDGING AT THE NOVA SCOTIA STEEL AND COAL COMPANY'S PIER, NORTH SYDNEY, CAPE BRETON COUNTY.

Sydney Harbour is on the north-east coast of Cape Breton. It is 3 miles wide at the mouth, but at 5 miles within the lighthouse, on Flat Point, the navigable channel contracts to the breadth of half a mile between the two bars of sand and shingle which extend from the shore on either side. Inside these bars the harbour divides into two arms, called the west and south arms. The harbour is easy of access, and is capable of containing any number of large vessels in safety. It is closed by ice between the end of December and the beginning of May.

The town of Sydney stands on the east side of the south arm, and is the shipping place for several coal mines.

North Sydney, distant 5½ miles, is on the north side of the west arm, and is also a point of shipment for large quantities of coal. The anchorage is sheltered by the north bar, north-westerly winds throw a heavy sea upon the bar and washes the sand into the harbour. From April 29 to May 29, 1902, the dredge 'St. Lawrence' was engaged deepening to 27 feet, where possible, at the front and sides of the Nova Scotia Steel and Coal Company's piers at North Sydney, removing 10,150 cubic yards of rock, sand, old timbers and silt at a cost of \$2,124.06, or 20.92 cents per cubic yard, and greatly improving the facilities for shipping the output from their mines.

During the fiscal year 1902-3 the dredge 'Geo. McKenzie' was engaged from May 13 to June 22 in further improving at the Nova Scotia Steel and Coal Company's piers, also at their ore pier, removing 5,040 cubic yards at a cost of \$2,202.93, or 43.70 cents per cubic yard.



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## DREDGING AT SALTER'S WHARF, NORTH SYDNEY, CAPE BRETON COUNTY.

The dredge 'Geo. McKenzie' worked, improving the depth of water in front of Salter's wharf, from June 23 to 25, 1903, removing 630 cubic yards at a cost of \$153.38, or 24'34 cents per cubic yard.

## DREDGING AT ST. MARY'S RIVER, GUYSBORO' COUNTY.

St. Mary's river flows into the Atlantic ocean, 112 miles E.N.E. of Halifax. Large quantities of deals and other lumber are shipped from here. At the mouth of the river is a sand bar or shoal about 1,800 feet across, from 15 feet depth outside to 15 feet inside the bar. The dredge 'St. Lawrence' was engaged from July 11 to November 17, 1900, and from May 3 to June 30, 1901, in dredging this bar to 15 feet at low water spring tides, removing 47,687 cubic yards of sand, gravel and boulders; and from July 1 to 14, 1901, and June 9 to 30, 1902, continued the work, removing a further quantity of 8,925 cubic yards of sand and gravel at a cost of \$2,749.99, or 30'81 cents per cubic yard, and the work is being continued on the bar and on a shoal a distance up the river.

The 'St. Lawrence' continued the work on the bar during the fiscal year 1902-3. from July 1 to October 13, removing 5,628 cubic yards at a cost of \$1,245.55, or 22.13 cents per yard; and up the river removing the quantity of 25,200 cubic yards at a cost of \$2,336.75, or 9'27 cents per cubic yard, when the work was closed, and the dredge left for Pictou.

## DREDGING BY HAND AT THE RACQUETTE, DIGBY COUNTY.

Hand dredging was performed in front of the wharfs at the Racquette from August 7 to September 13, removing 1,645 cubic yards of sand at a cost of 30'17 cents per yard.

## PROVINCE OF PRINCE EDWARD ISLAND.

## DREDGING AT HALLIDAY'S WHARF, BELFAST, QUEEN'S COUNTY.

The dredge 'Prince Edward' was employed from June 18 to 30 removing 2,070 cubic yards mud and sand around Halliday's wharf, at a cost of 47'61 cents per cubic yard, and preparing a place of shelter for vessels there with a depth of 8 feet of water at low tide.

## DREDGING AT MONTAGUE RIVER, KING'S COUNTY.

The dredge 'Prince Edward' was engaged in the channel and at the wharfs here from August 30 to December 10, 1902, and from April 30 to June 17, 1903, in removing 39,195 cubic yards at a cost of 17'23 cents per cubic yard, and improving the channel to 10 feet at low water spring tides, leaving work unfinished.

## DREDGING AT MURRAY HARBOUR, KING'S COUNTY.

The dredge 'Prince Edward' was engaged in the channel and at the wharfs here from July 1 to 18 and August 17 to 22, 1902, in removing 6,952 cubic yards sand and mud at a cost of 16'95 cents per cubic yard, and improving the channel to 10 feet at low water.



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## DREDGING AT MURRAY RIVER RAILWAY, KING'S COUNTY.

The dredge 'Prince Edward' was engaged in dredging a foundation for a pier at the terminus of the Murray river branch railway from July 19 to August 16, removing 5,926 cubic yards sand and clay at a cost of 20'29 cents per yard.

## DREDGING AT MURRAY HARBOUR SOUTH, KING'S COUNTY.

The dredge 'Prince Edward' was engaged from August 23 to 29 at Murray Harbour south, improving the depth of water in the channel in front the steamboat 'Electra's' wharf, removing 1,800 cubic yards at a cost of 18'26 cents per cubic yard.

## PROVINCE OF NEW BRUNSWICK.

## DREDGING AT CAPE TORMENTINE.

Cape Tormentine, a headland of New Brunswick, in Northumberland strait, in the county of Westmoreland, 22 miles from Sackville. The Anglo-American Submarine Telegraph Cable crosses the strait here to Cape Traverse, Prince Edward Island, and ice boats carry the mail and passengers during the winter, the distance from shore to shore is 9 miles. It is intended to have steamship communication during summer and winter from this point if possible. It is the terminus of the New Brunswick and Prince Edward Island Railway. Has a post office, telephone, telegraph, good harbour, one good hotel, Dominion Express, lobster factories and one church. Farming and fishing is carried on successfully. A large number of vessels load here for foreign ports with sawn lumber, products of the sea and farm. From July 14 to October 31, 1902, the dredge 'Cape Breton' was engaged at Cape Tormentine opening a channel for the winter steam service from deep water into and alongside the pier and improving the basin inside the pier, for the accommodation of large sailing vessels and ocean steamers; 35,120 cubic yards were removed at a cost of \$6,339.33, or 18'5 cents per yard. Much time was lost by winds and bad weather.

Spring tides rise 6 feet, neaps, 3 feet.

## DREDGING AT CHIPMAN'S BRIDGE TO BRIGG'S CORNER, QUEEN'S COUNTY.

From Chipman's Bridge to Brigg's Corner is a distance of about 13,300 feet, and near the latter point quantities of lumber are manufactured, which with logs cut and floated down the Salmon river, seek export at St. John harbour. During the summer season the water in Salmon river is very shoal, in places merely a rivulet, necessitating the sawn lumber being thrown into the water and floated down below Chipman bridge, where it is placed on scows or in small vessels, and taken to St. John for export. Placing the newly sawn lumber in the water causes it to discolour and become dark while in vessel in transport, and therefore deteriorates in value. To remedy this, the dredge 'New Dominion' was engaged from April 28 to June 30, 1901, while the freshet remained in the river, and improved the same to enable the removal of lumber by barges and at the latter date had removed 29,300 cubic yards of mud, sand and silt to a place of deposit at a cost of 11'65 cents per cubic yard, and giving good satisfaction as far as the work had been proceeded with. During the fiscal year 1901-02 the work was continued from July 1 to 24 and October 24 to 30, and again from April 15 to June 30, 1902, removing the further quantity of 50,375 cubic yards at a cost of 11'20 cents per cubic yard.



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During the fiscal year 1902-03 the work was continued from April 30 to June 22, removing 24,600 cubic yards at a cost of 9'45 cents per cubic yard, when under instructions the work was closed.

## DREDGING AT GRAND LAKE FLATS.

This large, important and beautiful lake, in Queen's county, has a length of over 25 miles, and a breadth of 6 miles. Its outlet is the Jemseg, a small but deep stream flowing into the River St. John opposite Gagetown, and about 35 miles from St. John city. The principal affluents of the lake are Salmon and Newcastle rivers, the former navigable for 10 miles from its mouth for steamers, and 75 miles for canoes, the latter 48 miles for canoes. On the banks of these rivers and the lake are extensive coal veins. Salmon, gaspereau and trout and other fish abound in the lake and streams flowing into it. The scenery is beautiful. Grand lake has on its banks several flourishing villages, fine farms and various industries.

At the southern end or outlet of Grand lake there are extensive mud flats, which were an obstruction to navigation. The local government opened a channel through these flats, over a mile in length, some years ago.

The work of the department with the dredge 'New Dominion' on Grand lake commenced in 1875-6, in lengthening to  $1\frac{1}{2}$  miles, deepening to 12 feet and otherwise improving this channel, and in improving the approaches to the public landing places of the small villages of McMann's Cove, Newcastle and Salmon River, on the banks of the lake near its northern and north-eastern extremities. Steamers from St. John call at the various landing places on this lake to its northern extremity, and many of them are growing summer resorts. Dredging was done in the years 1875-6, '76-7, '82-3, '86-7, '87-8, '89-90, and the total amount performed is 93,555 cubic yards removed at a cost of \$16,372.96. The work was continued from July 1 to November 8, 1902, and June 23 to 30, 1903, improving the channel to 10 feet at low summer level, and 75 feet in width, and at the close of this fiscal year 60,137 cubic yards had been removed at a cost of 8'38 cents per cubic yard. The work is still progressing.

## DREDGING AT POINT DUCHENE, WESTMORELAND COUNTY.

On Northumberland strait, the north-east terminus of the Shediac branch of the Intercolonial Railway, 2 miles from Shediac. It has long piers for shipping and range lights on Shediac island (at the entrance) and on the pier head.

The Prince Edward Island Steam Navigation Company steamers run every day between this port and Summerside, P.E.I., while navigation is open, and connects with the trains. There are several stores, two or three hotels, telegraph and express offices, &c., and a population of about 250. Here is Shediac harbour, the easiest of access and egress on this part of the coast. It is superior to Buctouche and Cocagne in the depth over the bar, and more extensive than the latter. The mooring frontage for ships of 12 to 17 feet draught being  $\frac{3}{4}$  of a mile in length, from two to three cables wide, and well sheltered. The country about Shediac is fertile and well settled. The improvement of the channel from Chene Spit into and along the piers by dredging has occupied the attention of the department for several years. In 1874-5 the 'Canada' worked here; also in 1882-3, and 1883-4, and in 1890-1, the dredge 'St. Lawrence,' giving a total amount excavated to that date of 69,700 cubic yards at a cost of \$21,125.92. A depth of 15 feet at low water spring tides was made. Spring tides rise 4 feet, neaps 2 feet.

The dredge 'Cape Breton' was engaged here from November 1 to 30, 1902, and May 11 to June 30, 1903, in completing a 15-foot channel 100 feet wide at low water, from the line of range lights on Shediac island to the outer end of the public wharf, and a basin in front of the wharf to 19 feet at low water 360 feet in length, 140 feet



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wide, removing 40,110 cubic yards at a cost of \$4,915.80, or 12.25 cents per yard, and was still prosecuting the work at the close of the fiscal year.

## DREDGING AT SPRINGHILL, YORK COUNTY.

The work was continued here on the Russell bar from July 1 to 13, and August 25 to November 7, 1902, and April 30 to June 30, 1903, removing 28,885 cubic yards gravel and sand at a cost of 16.59 cents per cubic yard. The work is being further prosecuted.

## MARITIME PROVINCES, DREDGES.

*The Dredge 'St. Lawrence.'*

Commencing the fiscal year 1902-03, the dredge 'St. Lawrence' was operating at St. Mary's river, Guysboro' county, N.S., on the bar at the entrance, and a distance up the river, improving the depth of the water over the bar to 15 feet at low water, and up the river to 13 feet, and continuing the work until October 13, when the dredge was ordered to the Intercolonial Coal Mining Company's works at Abercrombie Point, on the East river, Pictou county, where it was engaged to December 9, in dredging for loading berths around the new pier at that place. At the last named date, the dredge was ordered into winter quarters at C. Dwyer's wharf; examined boiler and had necessary repairs made. On examining the buckets, they were found worn past repair, except the cast steel bottoms; tenders were received and a new set contracted for; a set of new link pins, and a set of link bushings were put in, engines, condenser pumps and dredging machinery overhauled, the lost motion taken up and renewals made where necessary. All repairs being completed, the dredge resumed work on the East river, Abercrombie Point, at the Intercolonial Coal Mining Company's piers, Pictou county, N.S., on April 16, where it continued until June 1, when work at that place was completed, and the dredge removed to the marine slip to clean and paint. The slip not being ready, on June 5, work was commenced at the Intercolonial Railway pier, and completed by the 20th, when the dredge was placed on the marine slip, cleaned and painted, and was launched on June 30, and is under orders for work on the Richibucto bar, Kent county, N.B.

*The Dredge 'Canada.'*

At the commencement of the fiscal year 1902-03 this dredge was operating on the bar at Liverpool, Nova Scotia, where it continued until December 13, when it was ordered into winter quarters. During the winter, engines, boilers, pumps, condenser, winches and machinery were overhauled and necessary repairs made. Two new cylinders took the place of those condemned on the winches; new mouthpieces or lips were placed on the full set of buckets. Repairs being fully completed, work resumed on the bar and channel at Liverpool, N.S., where it was prosecuting the work at the close of fiscal year.

*The Dredge 'New Dominion.'*

This dredge was continuing the work at Grand Lake Flats at the commencement of the fiscal year 1902-03, where it continued until November 8, when it was placed in winter quarters. Boiler, engines, pumps, winch and all machinery examined and placed in good repair; also the scows, so far as possible, but they are worn out, and new ones will be required before commencing another season's work. On April 30 work was resumed on the Salmon river between Chipman and Brigg's Corner, Queen's county, N.B., and continued until June 22, when the river had fallen too low to float out the scows, and under orders the dredge resumed work on June 23, on the Grand Lake Flats, where it was vigorously prosecuting the same at the close of the fiscal year.



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*The Dredge 'Prince Edward.'*

The dredge 'Prince Edward' was, at the commencement of the fiscal year 1902-03, engaged in improving the channel at Murray river, King's county, Prince Edward Island, where it continued until July 18, when, under orders, the preparing of the foundation for a terminus pier for the Murray Harbour branch railway was undertaken, and by August 16, completed. Work was resumed on August 17, and continued August 22 improving the river channel. On the 23rd, the dredge was removed to and worked at Murray Harbour south until the 29th, improving the depth of water in front the steamer 'Electra's' wharf there. Under orders, the dredge was removed to and worked on the Montague river from August 30 to December 10, when it went into winter quarters, and during the winter much necessary repairs were made to engines, boiler, machinery, hull scows and water scow. The dredge went to work on the Montague river, and continued improving the channel there until June 17, when it was removed to Halliday's wharf, Belfast, Queen's county, Prince Edward Island, and worked from June 18 to 30, and was then continuing the work there.

*The Dredge 'George McKenzie.'*

The new hull for this dredge was completed, and under orders it proceeded from River St. John (as soon as tugs could be procured) to Pictou, N.S., where it worked from November 22 until December 9, at which time ice made in the river, and the dredge went into winter quarters at Dwyer's wharf. During the winter, boiler, engine and dredging machinery were overhauled and placed in working order. The dredge proceeded to North Sydney, Cape Breton county, N.S., where it worked at the Nova Scotia Steel and Coal Company's coal and ore piers from May 13 until June 22, and June 23 to 25 at Salter's wharf, when orders were given and it proceeded to Mabou, Inverness county, N.S., and was on the voyage at the close of fiscal year.

*The Dredge 'Cape Breton.'*

At the commencement of the fiscal year 1902-3 this dredge was prosecuting the work at Digby county, N.S., and continued work until July 13 (work unfinished), when under orders it left for Cape Tormentine, Westmoreland county, N.B., where it worked until October 31, and then proceeded to Point du Chene, same county, and worked from November 1 to 30, when it was placed in winter quarters at the railway wharf there. During the winter, necessary repairs were made to the machinery, engines, boiler, pumps and condenser, the largest repairs being made on the dredge's bucket. In the spring the work at Point du Chene was resumed on May 11, and was in vigorous operation at the close of the fiscal year.

*The Dredge 'New Brunswick.'*

This dredge, at the commencement of the fiscal year 1902-3, was prosecuting the work on Russell and Chapel bars above Springhill, on the St. John river, and continued there until November 7, when it was ordered into winter quarters at St. John. During the winter, necessary repairs were made to hull, boiler and machinery; also to dredge's scows. All of which being completed, the dredge proceeded up the river on April 30, and resumed work on the Russell and Chapel bars, and was continuing the same with good success at the close of the year.

*The Steam Launch 'Cricket.'*

Attended the dredge 'New Brunswick' during the year. Repairs were made during the winter to the hull, engines, boiler, &c., and a new wheelhouse was built.



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*Hand Dredging.*

At the Racquette, Digby county, N.S., hand dredging was performed in front of the wharfs at that place.

MEMORANDUM of the quantities removed by the several dredges and by hand in the Maritime provinces during the fiscal year 1902-3.

	Cubic Yards.
'St. Lawrence' . . . . .	78,428
'Canada' . . . . .	37,350
'New Dominion' . . . . .	84,737
'Prince Edward' . . . . .	55,943
'Geo. McKenzie' (not in commission—new hull building)	7,110
'Cape Breton' . . . . .	86,990
'New Brunswick' . . . . .	37,240
Hand dredging . . . . .	1,645
	<hr/>
	389,443

## DREDGING PLANT.

The following is a summary description of the dredging plant owned and operated by the Public Works Department in the Maritime provinces :—

*The self-propelling Elevator Dredge 'St. Lawrence' (iron hull).*

Length over all—175 feet.

Beam—30 feet.

Draught when loaded aft—13'5 feet.

Draught when loaded forward—8'5 feet.

Least working depth (ladder with 32 buckets dropped 30 feet from bow).—8'5 feet.

Greatest working depth (bucket ladder dropped 40 feet from bow)—28'0 feet.

Capacity of hopper for spoil material—350 cubic yards.

Speed when light—6 to 7 miles per hour.

Speed when loaded—3 to 4 miles per hour.

Daily rate of dredging:

Hard material—350 to 700 cubic yards.

Ordinary earth—750 to 1,000 cubic yards.

Soft material—1,050 to 1,400 cubic yards.

*The self-propelling Elevator Dredge 'Canada' (iron hull).*

Length over all—130 feet.

Beam—20 feet.

Draught when loaded aft—11'5 feet.

Draught when loaded forward—7'0 feet.

Least working depth—7'0 feet.

Greatest working depth (ladder 24 buckets)—16'0 feet.

Capacity of hopper for spoil material—90 cubic yards.



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Speed when light and newly painted—6 to 7 miles per hour.

Speed when loaded—3 to 4 miles per hour.

Daily rate of dredging:

In hard bottom—180 to 270 cubic yards.

With ordinary digging—180 to 360 cubic yards.

In soft material—360 to 450 cubic yards.

*The Spoon Dredge 'New Dominion' (wooden hull).*

Length over all—90 feet.

Width—28 feet.

Draught—5½ feet.

Greatest working depth—21 feet.

Daily rate of dredging:

In hard material—300 cubic yards.

With ordinary material—450 cubic yards.

In soft material—600 to 700 cubic yards.

Number of dump scows or barges used—4 (2 are condemned).

*The Spoon Dredge 'Prince Edward' (wooden hull).*

Length over all—80 feet.

Width—28 feet.

Draught—6 feet.

Greatest working depth—21 feet.

Daily rate of dredging:

Hard material—300 cubic yards.

With ordinary material—500 cubic yards.

In soft material—600 to 700 yards.

Number of dump scows or barges used—3.

*The Spoon or Dipper Dredge 'George McKenzie' (wooden hull).*

Length—90 feet.

Width—28 feet.

Draught—6 feet.

Greatest working depth—22 feet.

Daily rate of dredging:

In hard material—350 cubic yards.

Ordinary material—500 cubic yards.

In soft material—600 cubic yards.

Number of dump scows or barges used—3.

*The Boom and Dipper Dredge 'Cape Breton' (steel hull).*

Length—91 feet.

Beam—36 feet.

Draught—7½ feet.

Greatest working depth—34 feet.

Daily rate of dredging:

In hard material—1,000 cubic yards.

Ordinary material—1,500 cubic yards.

Soft material—2,000 yards.

Number of barges used (each of 210 cubic yards capacity, steel)—2.



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*The Clam Shell Dredge 'New Brunswick' (wooden hull).*

Length over all—90 feet.

Width—25 feet.

Draught—2½ feet.

Greatest working depth—17 feet.

Daily rate of dredging:

    In hard material—180 cubic yards.

    Ordinary material—300 cubic yards.

    Soft material—450 cubic yards.

Number of decked scows used—3.

One pile driver, engine and boiler fitted on scow.

One stone lifter, engine and large grips (no boiler).

One (old) small scow for coal, belonging to 'New Dominion,' at St. John, condemned.

Two old side hopper scows at Pictou, unfit for use, belonging to 'Prince Edward.'

One old side hopper scow, unfit for use, belonging to 'Geo. McKenzie,' at Pictou.

(The above scows condemned, rotten and useless, have been broken up, and any material of use saved.)



CLASSIFICATION of Disbursements of the Dredges in the Maritime Provinces during the Year ending June 30, 1903.  
DREDGE 'ST. LAWRENCE.'

ITEMS.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	483 33	477 43	483 33	483 33	425 30	463 59	324 32	248 29	296 23	443 12	483 33	483 33	5,094 93
Coal.....	255 63	304 16	292 60	367 77	135 00	141 00	.....	.....	72 63	262 50	330 00	90 00	2,251 28
Provisions.....	128 39	159 65	106 80	141 86	103 42	104 14	26 45	.....	.....	136 59	124 11	136 63	1,167 04
Stores.....	10 55	25 00	.....	4 70	13 38	9 72	.....	.....	.....	33 89	.....	64 56	161 80
Equipment.....	2 78	.....	.....	.....	.....	.....	.....	.....	59 65	10 00	.....	.....	72 43
Water.....	.....	.....	.....	4 50	1 80	.....	.....	.....	.....	23 20	.....	.....	29 50
Repairs.....	.....	.....	37 35	171 92	.....	101 95	122 33	.....	591 90	491 82	25 00	850 67	2,422 12
Pilotage.....	78 00	78 00	78 00	89 79	75 00	21 00	.....	.....	.....	45 00	78 00	60 00	602 79
Towage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wharfage.....	57 00	.....	57 00	14 00	.....	.....	.....	.....	.....	.....	.....	.....	128 00
Contingencies.....	60 00	9 09	.....	7 19	.....	.....	22 07	3 20	18 47	11 90	4 67	.....	136 59
Totals.....	1,075 68	1,053 32	1,055 08	1,285 06	753 90	841 40	494 17	280 67	1,038 88	1,458 02	1,045 11	1,685 19	12,066 48
Working expenses.....	1,075 68	1,053 32	1,017 73	1,113 14	753 90	739 45	12 50	Nil.	132 28	966 20	1,020 11	834 52	8,718 83
Repairs ordinary.....	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	491 82	25 00	850 67	1,367 49
" extraordinary	Nil.	Nil.	37 35	171 92	Nil.	101 95	481 67	280 67	906 60	Nil.	Nil.	Nil.	1,980 16
Totals.....	1,075 68	1,053 32	1,055 08	1,285 06	753 90	841 40	494 17	280 67	1,038 88	1,458 02	1,045 11	1,685 19	12,066 48



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DREDGE 'CANADA.'

Wages. ....	420 48	420 00	420 33	417 19	328 12	212 00	212 00	212 00	267 68	430 00	428 46	4,188 26
Coal.....	307 52	244 87	302 47	204 81	93 50	.....	.....	.....	177 94	342 75	289 50	2,183 48
Provisions. ....	114 53	114 38	112 19	100 41	45 15	.....	.....	.....	46 85	80 58	91 91	875 29
Stores.....	7 41	18 66	23 73	19 97	15 88	.....	.....	.....	40 28	8 77	72 19	443 31
Equipment.....	47 16	29 48	.....	.....	.....	.....	.....	.....	.....	74 23	.....	247 97
Water .....	5 00	5 00	5 00	.....	2 50	.....	.....	.....	5 00	5 00	5 00	37 50
Repairs.....	120 58	.....	100 21	83 30	232 60	167 54	.....	.....	1,337 56	16 81	369 55	2,884 14
Pilotage.....	54 00	52 00	52 00	50 00	24 00	.....	.....	.....	14 00	52 00	50 00	402 00
Towage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wharfage.....	15 00	15 00	15 00	15 00	7 50	.....	.....	.....	12 00	12 00	15 00	171 50
Contingencies. . .	5 85	3 27	6 74	5 03	2 43	.....	.....	.....	4 78	6 76	2 16	50 33
Totals.....	1,097 53	902 66	1,037 34	895 71	751 68	379 54	395 81	840 14	1,906 09	1,028 90	1,323 77	11,487 78
Working expenses....	976 95	902 66	937 13	812 41	519 08	.....	70 35	222 87	556 26	1,012 09	954 22	7,892 63
Repairs, ordinary .....	.....	.....	.....	.....	.....	.....	.....	.....	1,337 56	16 81	369 55	1,723 92
" extraordinary .....	120 58	.....	100 21	83 30	232 60	379 54	325 46	617 27	12 27	.....	.....	1,871 23
Totals.....	1,097 53	902 66	1,037 34	895 71	751 68	379 54	395 81	840 14	1,906 09	1,028 90	1,323 77	11,487 78

DREDGE 'NEW DOMINION.'

Wages .....	355 00	370 00	369 51	271 00	167 01	134 13	129 64	480 51	282 91	370 00	370 00	3,669 71
Coal .....	.....	.....	.....	.....	.....	.....	.....	.....	308 18	.....	184 52	694 58
Provisions .....	67 25	68 03	90 62	18 01	.....	.....	.....	.....	81 68	96 71	39 65	541 20
Stores.....	.....	.....	.....	.....	.....	.....	.....	.....	55 55	89 65	.....	145 20
Equipment.....	.....	.....	.....	.....	49 16	.....	.....	.....	61 71	70 09	.....	180 90
Water .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Repairs .....	.....	29 26	.....	2 72	32 39	.....	250 51	145 50	33 51	28 44	4 90	544 62
Pilotage .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Towage. ....	520 00	545 00	470 00	227 50	5 00	.....	.....	.....	200 00	504 50	780 00	3,752 00
Wharfage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Contingencies. ....	.....	1 87	27	1 38	9 48	.....	.....	.....	2 12	.....	2 22	23 44
Totals.....	942 25	1,174 62	930 40	520 61	262 98	134 13	380 15	626 01	1,025 66	1,159 39	1,381 29	9,551 65
Working expenses....	942 25	984 90	930 40	517 89	63 06	.....	.....	.....	928 27	1,130 95	1,376 39	8,031 34
Repairs, ordinary .....	.....	29 26	.....	2 72	32 39	.....	.....	.....	3 30	28 44	4 90	101 01
" extraordinary .....	.....	.....	.....	.....	167 53	134 13	380 15	626 01	94 09	.....	.....	1,419 30
Totals.. .....	942 25	1,174 62	930 40	520 61	262 98	134 13	380 15	626 01	1,025 66	1,159 39	1,381 29	9,551 65







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DREDGE 'PRINCE EDWARD.'

Wages.....	507 88	384 26	384 16	376 58	370 00	346 52	150 00	150 00	423 58	585 33	408 56	431 71	4,518 58
Coal.....	.....	92 70	252 66	.....	.....	.....	.....	.....	.....	225 00	.....	18 37	588 83
Provisions.....	167 66	.....	247 83	155 06	12 04	150 90	23 73	.....	5 00	10 56	54 36	177 04	1,004 18
Stores.....	6 47	84	41 05	10 10	.....	47 89	4 46	.....	.....	100 74	41 19	92 17	344 91
Equipment.....	.....	.....	20 10	.....	.....	.....	.....	.....	.....	21 40	.....	307 53	348 93
Water.....	68 65	25 00	94 62	61 87	25 00	27 87	16 25	.....	.....	.....	.....	64 62	383 88
Repairs.....	95 12	60 49	10 00	.....	41 99	460 82	31 39	.....	.....	558 54	318 07	561 33	2,137 75
Pilotage.....	.....	.....	20 00	.....	.....	.....	.....	.....	.....	.....	.....	2 00	22 00
Towage.....	650 00	94 42	1,225 00	650 00	600 00	375 00	.....	.....	.....	125 00	600 00	1,072 82	5,392 24
Wharfage.....	54 00	1 25	93 00	31 00	.....	47 00	17 45	.....	.....	20 00	31 00	20 50	315 20
Contingencies.....	.....	8 87	19 24	20 61	3 00	4 45	.....	.....	8 75	24 00	.....	39 67	128 59
Totals.....	1,549 78	667 93	2,407 56	1,305 22	1,052 03	1,460 45	243 28	150 00	437 33	1,670 57	1,453 18	2,787 76	15,185 09
Working expenses.....	1,316 78	607 44	2,397 56	1,305 22	1,010 04	999 63	93 28	.....	.....	526 70	1,135 11	2,226 43	11,618 19
Repairs, ordinary.....	18 42	.....	.....	.....	.....	425 57	.....	.....	.....	387 15	318 07	561 33	1,710 54
" extraordinary.....	214 58	60 49	10 00	.....	41 99	35 25	150 00	150 00	437 33	756 72	.....	.....	1,856 36
Totals.....	1,549 78	667 93	2,407 56	1,305 22	1,052 03	1,460 45	243 28	150 00	437 33	1,670 57	1,453 18	2,787 76	15,185 09

DREDGE 'GEO. MCKENZIE'.

Wages.....	.....	.....	.....	175 50	258 06	300 33	157 50	150 00	155 00	204 41	394 99	396 50	2,192 29
Coal.....	.....	.....	.....	103 91	.....	.....	.....	.....	.....	21 00	.....	.....	124 91
Provisions.....	.....	.....	.....	.....	41 56	24 19	44 00	.....	.....	61 50	83 73	169 58	424 56
Stores.....	.....	.....	.....	.....	82 41	8 68	.....	.....	.....	85 25	.....	.....	176 34
Equipment.....	163 76	.....	.....	2 84	.....	.....	.....	.....	.....	.....	.....	499 45	666 05
Water.....	.....	.....	.....	1 50	.....	.....	.....	.....	.....	.....	.....	41 00	42 50
Repairs.....	.....	.....	.....	.....	636 42	.....	15 20	62 03	.....	52 69	9 00	42 14	817 48
Pilotage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Towage.....	.....	.....	.....	.....	350 00	387 50	.....	.....	.....	.....	662 90	720 00	2,119 50
Wharfage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Contingencies.....	.....	.....	.....	3 02	8 61	.....	5 35	.....	.....	4 27	6 23	9 85	37 33
Totals.....	163 76	.....	.....	286 77	1,377 06	720 70	222 05	212 03	155 00	429 12	1,155 95	1,878 52	6,600 96
Working expenses.....	163 76	.....	.....	286 77	740 64	720 70	49 35	.....	.....	376 43	1,146 95	1,836 38	5,320 98
Repairs, ordinary.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52 69	9 00	42 14	103 83
" extraordinary.....	.....	.....	.....	.....	636 42	.....	172 70	212 03	155 00	.....	.....	.....	1,176 15
Totals.....	163 76	.....	.....	286 77	1,377 06	720 70	222 05	212 03	155 00	429 12	1,155 95	1,878 52	6,600 96



CLASSIFICATION of Disbursements of Dredges in the Maritime Provinces, &c.—Continued.  
‘CAPE BRETON’

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	433 98	435 00	425 61	433 01	417 05	316 45	135 51	160 50	180 00	287 11	427 94	435 00	4,087 16
Coal.....	238 93	6 60	90 75	193 20	.....	46 51	.....	107 54	.....	127 65	86 25	88 80	986 23
Provisions.....	209 00	59 32	193 15	125 70	31 95	72 07	28 71	.....	.....	43 71	123 10	111 39	998 10
Stores.....	16 50	.....	.....	53 73	.....	.....	18 56	.....	.....	133 01	.....	14 22	236 02
Equipment.....	115 38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	297 11	412 49
Water.....	.....	16 25	.....	35 00	25 00	.....	.....	.....	.....	.....	21 00	27 00	124 25
Repairs.....	400 26	.....	22 32	.....	109 89	4 66	.....	155 05	4 56	756 76	116 61	7 70	1,577 81
Pilotage.....	.....	.....	.....	.....	22 59	.....	.....	.....	.....	.....	6 00	6 00	34 59
Towage.....	260 50	325 00	3,474 09	675 00	184 28	928 74	.....	.....	.....	.....	450 00	941 88	7,239 49
Wharfage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Contingencies.....	2 40	7 26	.....	.....	.....	12 99	.....	9 35	.....	.....	10 70	2 99	45 69
Totals..	1,676 95	849 43	4,205 92	1,515 64	790 76	1,381 42	182 78	432 44	184 56	1,348 24	1,241 60	1,932 09	15,741 83
Working expenses.....	1,276 69	849 43	4,183 60	1,515 64	680 87	1,376 76	39 77	107 54	.....	574 84	1,124 99	1,924 39	13,654 52
Repairs, ordinary.....	.....	.....	.....	.....	4 99	4 66	.....	.....	.....	88 13	116 61	7 70	222 09
" extraordinary.....	400 26	.....	22 32	.....	104 90	.....	143 01	324 90	184 56	685 27	.....	.....	1,865 22
Totals.....	1,676 95	849 43	4,205 92	1,515 64	790 76	1,381 42	182 78	432 44	184 56	1,348 24	1,241 60	1,932 09	15,741 83



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CLASSIFICATION AND QUANTITIES OF Material removed by Dredges in the Maritime Provinces during the Year ending 30th June, 1903.

DREDGE 'ST. LAWRENCE.'

Description of Material Dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Total.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Clay and mud.....	.....	.....	.....	5,250	7,350	.....	.....	.....	.....	.....	700	.....	13,300
Clay.....	.....	.....	.....	1,050	.....	.....	.....	.....	.....	.....	.....	.....	1,050
Clay and gravel.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	700	.....	700
Sand—ordinary.....	12,162	10,266	6,650	700	.....	.....	.....	.....	.....	.....	.....	.....	29,778
Mud.....	.....	.....	.....	350	4,900	2,100	.....	.....	.....	6,650	10,850	8,750	33,600
Totals.....	12,162	10,266	6,650	7,350	12,250	2,100	.....	.....	.....	6,650	12,250	8,750	78,428

DREDGE 'CANADA.'

Mud.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,350	1,350
Sand—ordinary and sawdust.....	5,490	5,040	3,960	3,690	2,970	1,260	.....	.....	.....	.....	3,600	3,600	29,610
Sand.....	.....	.....	990	.....	.....	.....	.....	.....	.....	.....	.....	90	1,080
Mud and shells.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,260	2,790	1,260	5,310
Totals.....	5,490	5,040	4,950	3,690	2,970	1,260	.....	.....	.....	1,260	6,390	6,300	37,350

DREDGE 'NEW DOMINION.'

Sand and clay.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,325
Mud and sawdust.....	15,200	13,300	10,350	3,587½	1,437½	.....	.....	.....	.....	.....	3,825	3,500	42,437½
Clay.....	.....	950	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,387½
Mud, clay & sawdust.....	.....	.....	.....	5,062½	.....	.....	.....	.....	.....	.....	.....	.....	5,062½
Mud, sand & sawdust.....	.....	.....	4,300	.....	.....	.....	.....	.....	.....	.....	4,575	.....	8,875
Sand.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,650	6,050	12,700
Mud and clay.....	.....	.....	.....	2,312	487½	.....	.....	.....	.....	.....	.....	3,150	5,949½
Totals.....	15,200	14,250	14,650	10,962	1,925	.....	.....	.....	.....	.....	15,050	12,700	84,737



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CLASSIFICATION AND QUANTITIES OF Material removed by Dredges in the Maritime Provinces, &c.—Continued.  
DREDGE 'PRINCE EDWARD.'

Description of Material Dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Total.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Sand and rock . . . . .	810	1,596		315									2,721
Clay . . . . .												2,070	2,070
Sand and mud . . . . .	2,160	1,305	1,845	270									5,580
Sand . . . . .	5,895	1,967	270										8,132
Mud . . . . .	450	495	5,130	8,190	8,910						10,080	4,185	37,440
Totals . . . . .	9,315	5,363	7,245	8,775	8,910						10,080	6,255	55,943

DREDGE 'GEO. MCKENZIE.'

Hard-pan and rock . . . . .																									405
Mud, stone and logs . . . . .																									4,095
Logs, stone and old hull . . . . .																									720
Mud . . . . .									270		1,170										135		315		1,890
Totals . . . . .									270		1,170										1,485		4,185		7,110

DREDGE 'CAPE BRETON.'

Sand . . . . .																									1,050
Mud and oystershells . . . . .																									15,960
Mud, oyster shells and logs . . . . .									4,200												15,330				19,530
Clay and rock . . . . .					3,360		2,415																		5,775
Clay and stone . . . . .					4,040																				4,040
Logs, sand and mud . . . . .	2,310																								2,310
Sand and mud . . . . .	9,450	5,985			9,135		10,185																3,570		13,020
Mud and rock . . . . .																									25,305
Totals . . . . .	11,760	5,985			16,535		12,600		4,200												15,330		20,580		86,990



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## DREDGE 'NEW BRUNSWICK,'

Gravel .....	7,455	4,265	4,235	7,520	630	.....	.....	.....	.....	2,170	1,995	28,270
Clay, gravel and rock .....	.....	.....	1,260	.....	.....	.....	.....	.....	.....	.....	.....	1,260
Rock and gravel .....	.....	1,385	.....	.....	.....	.....	.....	.....	.....	3,210	3,115	7,710
Totals.....	7,455	5,650	5,495	7,520	630	.....	.....	.....	.....	5,380	5,110	37,240

## HAND DREDGING.

[illegible]



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DETAILS OF DREDGING IN THE MARITIME PROVINCES.

For the Fiscal Year ended June 30, 1903.

Dredge.	Locality.	Date.	Time Dredging.		Quantity. Cubic Yards.	Expenditure at Locality.		Per Cubic yard for Local Expenditure.	Wintering, Repairs, Equipment and Superintendence, <i>pro rata</i> .		Total Cost.	Per Cubic Yard for Total Expenditure.	
			Hrs.	Min.		\$	cts.		\$	cts.		\$	cts.
St. Lawrence	Bar., Sonora, St. Mary's River, Guysboro' Co., N.S.	July 1 to Oct 13, 1902 alternately	89	45	5,628	1,245	55	0 22.13	958	78	2,204	33	0 39.16
	St. Mary's Pier, (Guysboro' Co., N.S.)	July 1 to Oct. 13, 1902.....	174	55	25,200	2,386	75	0 09.27	1,798	76	4,135	51	0 16.41
	Intercolonial Coal Mining Co., Pictou, N.S.	Oct. 14 to Dec. 9, 1902, and April 16 to June 1, 1903.....	216	55	39,200	3,294	52	0 08.40	2,536	02	5,830	54	0 14.87
	Intercolonial Ry. Pier, Pictou, N.S.	June 5 to 20, 1903.....	41	50	8,400	379	17	0 04.51	291	87	671	04	0 07.99
Canada	Liverpool, Queen's Co., N.S.	July 1 to Dec. 13, 1902, and April 25 to June 30, 1903....	561	20	37,350	7,369	21	0 19.73	4,856	34	12,225	55	0 32.73
New Dominion.	Grand Lake Flats, Queen's Co., N.B.	July 1 to Nov. 8, 1902, and June 23 to 30, 1903.....	919	00	60,137	5,040	51	0 08.38	1,914	85	6,955	36	0 11.56
	Between Chipman and Brigg's Corner, Salmon River, Queen's Co., N.B.	April 30 to June 22, 1903....	338	00	24,600	2,326	09	0 09.45	883	63	3,209	72	0 13.04
Prince Edward.	Murray River, King's Co., P.E.I.	July 1 to 18, and Aug. 17 to 22, 1902.....	150	45	6,952	1,178	84	0 16.95	644	27	1,823	11	0 26.22
	Murray River Railway Co., P.E.I.	July 19 to Aug. 16, 1902.....	205	20	5,926	1,202	89	0 20.29	657	41	1,860	30	0 31.39
	Murray Harbour South P.E.I.	August 23 to 29, 1902.....	53	00	1,800	328	67	0 18.26	179	63	508	30	0 28.23
	Montague Bridge, P.E.I.	Aug. 30 to Dec. 10, 1902, and April 30 to June 17 1903.....	873	25	39,195	6,753	43	0 17.23	3,690	95	10,444	38	0 26.64
	Halliday's Wharf, Queen's Co., P.E.I.	June 18 to 30, 1903. ....	45	00	2,070	985	59	0 47.61	538	65	1,524	24	0 73.63
Geo. McKenzie.	I. C. Ry. Wharf, Pictou Co., N.S.	Nov. 22 to Dec. 9, 1902.....	27	00	1,440	1,064	12	0 73.89	1,121	37	2,185	49	1 51.77
	N. S. Steel & Coal Co., North Sydney, C.B.	May 13 to June 22, 1903.....	195	00	5,040	2,202	93	0 43.70	2,321	46	4,524	39	0 89.76
	Salter's Wharf, North Sydney, C.B.	June 23 to 25, 1903.....	20	00	630	153	38	0 24.34	161	63	315	01	0 50.00



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Cape Breton....	Digby, Digby Co., N.S.....	July 1 to 13, 1902.....	57	45	11,760	538 60	0	04 58	226 47	765 07	0	06 50
	Cape Tormentine, Westmoreland Co., N.B.....	July 14 to Oct. 31, 1902.....	251	15	35,120	6,339 33	0	18 05	2,665 59	9,004 92	0	25 64
	Point du Chêne, Westmoreland Co., N.B.....	Nov. 1 to 30, 1902, and May 11 to June 30, 1903.....	218	30	40,110	4,915 80	0	12 25	2,067 01	6,982 81	0	17 41
New Brunswick.	Russell Bar., York Co., N.B.....	July 1 to 13, 1902, and Aug. 25 to Nov. 7, and April 30 to June 30, 1903.....	925	13	28,885	4,790 59	0	16 59	3,042 04	7,832 63	0	27 11
		July 1 to Aug. 24, 1902.....	280	00	8,355	1,351 65	0	16 17	858 31	2,209 96	0	16 45
	Chapel Bar., York Co., N.B.....		5643	58	387,798	53,797 62	0	13 89	31,415 04	85,212 66	0	21 97



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## PROVINCE OF QUEBEC.

RIVER ST. LAWRENCE SHIP CHANNEL,  
OTTAWA, January 12, 1904.

SIR,—According to your instructions I beg to present the following annual report on the operations for the improvement of the River St. Lawrence Ship Channel, during the fiscal year ended June 30, 1903:—

Physical Features.

Present Navigation.

General Information.

History of the Ship Channel.

Present Project.

Cost of the Ship Channel to date.

Progress of Operations to date.

Division I. Completed.

Estimate, 30 Foot Channel.

Dredges.

General Notes on Dredging Operations.

Sorel Ship Yard.

Description of Dredging Plant.

Table I. Abstract of Operations.

Table II. Classification of Disbursements.

I have the honour to be, sir,

Yours obediently,

F. W. COWIE,

*Engineer in charge.*

EUGÈNE D. LAFLEUR, Esq., C.E.,  
Acting Chief Engineer,  
Department of Public Works,  
Ottawa, Ont.

## RIVER ST. LAWRENCE SHIP CHANNEL.

*Physical Features.*

The distance between Montreal and Quebec by the River St Lawrence ship channel is 160 miles. Of this distance about 65 per cent is natural deep water not requiring any improvement.

From Montreal to Three Rivers, 82 miles, the tide is not appreciable.

From Three Rivers to Batiscan, 20 miles, the tide can always be felt, but owing to uncertainty of time and height, it cannot be depended upon for navigation.

From Batiscan to Portneuf, 22 miles, during 6 hours out of every 12, half-tide giving an additional depth of from  $1\frac{1}{2}$  to 4 feet, may be taken advantage of by passing during that 6 hours.

From Portneuf to Quebec, 36 miles, there is a tide of from 9 to 15 feet, giving tidal navigation for about 9 hours out of every 12.

The water in the river has a very great annual fluctuation. The average height above ordinary low water is for May,  $6\frac{1}{2}$  feet; June,  $4\frac{1}{2}$  feet; July,  $3\frac{3}{4}$  feet; August,  $1\frac{3}{4}$  feet; September, 1 foot; October,  $\frac{1}{2}$  foot; November,  $\frac{3}{4}$  foot.



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The total fall in water level in the river at ordinary low water, between Montreal and Quebec, is about 29 feet.

From Montreal to Three Rivers, 11 feet; from Three Rivers to Batiscan,  $3\frac{1}{2}$  feet; from Batiscan to Portneuf,  $10\frac{1}{2}$  feet; and from Portneuf to Quebec, 4 feet.

The current varies throughout. It is strongest at St. Mary's Current in Montreal Harbour, at Cap à la Roche, and at the Richelieu rapids. It is quite gentle in Lake St. Peter.

The general average is about  $2\frac{1}{2}$  miles per hour.

The River St. Lawrence between Quebec and Montreal is usually free from ice about April 10, and closed to traffic about November 25, making the season of navigation about  $7\frac{1}{2}$  months.

*Present Navigation.*

The present navigable channel between Montreal and Quebec has a depth of  $27\frac{1}{2}$  feet at ordinary low water, and a minimum width of 300 feet.

The improved channel is being made 30 feet deep at the extreme low water level of 1897, the lowest ever reached except for a few days in 1895.

The new channel will give nearly 4 feet greater draught for navigation than the present channel.

The average depth of water in the  $27\frac{1}{2}$  foot channel, with the greatest and least depths in each year from May to November, since 1890, is given in the following table :—

Year.	Average depth for each month.							From Sorel gauge, during each year (May to Nov.).	
	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Highest.	Lowest.
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
1890.....	35 6	35 3	31 9	30 6	30 9	29 9	30 6	37 0	29 0
1891.....	34 6	31 3	29 9	29 9	30 0	28 3	28 3	36 9	27 3
1892.....	31 0	31 9	31 6	30 6	28 9	28 3	28 3	33 6	27 3
1893.....	36 0	34 3	30 9	29 9	29 6	28 6	28 0	37 6	27 6
1894.....	34 6	31 9	31 0	29 2	28 3	28 9	29 0	36 0	27 7
1895.....	33 3	31 3	28 3	28 3	27 6	26 9	26 9	34 6	25 10
1896.....	33 6	30 6	28 9	28 0	27 6	27 9	29 0	37 0	27 4
1897.....	35 6	32 6	30 3	29 3	28 0	27 0	27 6	37 0	26 5
1898.....	31 6	30 9	29 8	28 6	28 2	28 3	28 6	32 1	26 9
1899.....	36 2	31 9	30 3	28 6	27 6	28 0	27 9	37 9	26 9
1900.....	33 6	30 9	30 6	29 6	28 1	28 9	29 2	35 9	27 4
1901.....	34 3	31 10	29 2	28 3	27 7	27 4	27 3	36 3	26 6
1902.....	33 2	32 2	32 2	29 4	28 1	28 1	29 0	34 1	27 6
1903.....	32 0	30 11	30 5	29 5	28 4	29 0	27 11	32 8	26 11

During the season of 1903, except for a few days at the end of the month of November, after all the large ships had sailed, the water in the River St. Lawrence was considerably higher than the average and vessels as a rule loaded to a greater draught than ever before.

*General Information.*

The whole of the ship channel between Longue Pointe, the eastern limit of Montreal Harbour and Quebec, where dredging has been done or where otherwise doubtful, was thoroughly tested during the season of 1903. No boulders or obstructions of a dangerous character were found.

During the supervision of the dredging, the testing, and other work, the usual precautions were taken and assistance given for the aid and safety of navigation.



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In the River St. Lawrence ship channel proper there were during the season eight accidents to ocean-going ships. None were of a serious character, further than the delay and cost of being re-floated, and none were in any way due to the ship channel.

Two serious accidents, apart from these happened in Montreal Harbour.

The following is a list of the accidents in the ship channel:—

'*Carrigan Head*,' Lake St. Peter; aground; buoys dragged out of position.

'*Dominion*,' Cap Levraut; scraped; unknown object, no damage.

'*Campana*,' Vercheres; aground; lights obscured by steamship at anchor.

'*Ibernian*,' Lake St. Peter; aground; mistook buoy in smoky weather.

'*Farmond*,' Contrecoeur, aground; smoke, got off without trouble or damage.

'*Drottning Sophia*,' Lake St. Peter; aground; fog, hauled off by '*Eureka*' and dredge tug.

'*Hektos*,' Lake St. Peter; aground; went on bank after slight collision with '*Drottning Sophia*.,

'*Mount Royal*,' St. Antoine; aground 1 hour; channel 1 mile wide.

During the season of 1903 the total number of ocean going vessels passing up and down was 802, an increase of 45 over last year. The total tonnage amounted to nearly 1,900,000 tons, about 350,000 tons greater than any previous year.

That means about an average of 10 ocean-going vessels per day passing in one direction or the other through the ship channel. An equal tonnage by railway would make 80 loaded trains per day.

### *History of the Ship Channel.*

Before the commencement of any dredging operations, the depth on the flats of Lake St. Peter was about 11 feet at the ordinary autumn low water of that time.

The actual improvements were commenced in 1844, and continued by the government as a public work until 1846, and abandoned the following year owing to opposition to the location of the channel.

Legislation was passed in 1850 transferring the plant and authorizing the Montreal Harbour Commissioners to borrow money and proceed with the works as they should deem best.

From 1851 to 1888 all operations for the improvement of the St. Lawrence between Montreal and Quebec were carried on by the Montreal Harbour Commissioners, the interest on the cost of the work being defrayed by a tonnage tax on all vessels drawing 10 feet and upwards.

In 1888 the channel from Montreal to Cap à la Roche was completed to 27½ feet at ordinary low water, and from there to Quebec 27½ feet at half tide.

The government decided in 1888 to re-adopt the River St. Lawrence ship channel as a public work.

Under the Public Works Department, from 1888 until 1898, the work begun by the Harbour Commissioners was continued.

The difficult rock work at Cap à la Roche and Cap Charles was completed, as designed.

Almost all of the dredged portions of the river, except the channel in Lake St. Peter were cleaned up or deepened, and many curves and narrow places were widened.

Surveys were made, and between Cap Charles and Quebec, to avoid the necessity of waiting for the tide, channels were dredged through several shoals.

The extraordinary low water of 1895 and 1897, and the increase in the size of vessels, urgently called for a wider and deeper channel.

In 1897 it was decided to construct new plant consisting of large and powerful dredges, tugs, barges, &c., suitable for channel improvement on a large scale.



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*Present Project.*

In 1899 the dredging plant was in a position to warrant the commencement of a more extensive plan of operations, and as two new dredges of a large type, with tugs and plant, had proved their efficiency, two powerful steel dredges designed according to the best practice and experience in this identical work, with tugs, &c., were almost completed and two more to complete the six required, were authorized.

With a proper dredging fleet assured, and the necessary shops and ship yard at Sorel available, the work of the 30 foot channel was undertaken.

The low water of 1897, the lowest on record except the short period of extraordinary low water of 1895, was adopted as the plane or river level at which the channel would be made 30 feet in depth.

It was also decided to make the channel as wide as could be dredged in one cut, viz, 450 feet.

The present object of the dredging operations is to obtain in the shortest possible time a ship channel between Montreal and Quebec for safe 30 foot navigation. The minimum width for the tangents has been fixed at 450 feet, but the bends are widened out to from 500 to even 750 feet. The dredging is being done to give a clear depth of 30 feet at the extreme low water of 1897.

The navigable depth in this channel as being dredged, during the season of 1903, was as follows:—

	Feet.	Inches.
May.. . . . .	35	8
June.. . . . .	34	7
July.. . . . .	34	1
August.. . . . .	33	1
September.. . . . .	32	0
October.. . . . .	32	8
November.. . . . .	31	7

The greatest depth from May to November was 36 feet 4 inches, and the least, at the end of November, 30 feet 7 inches.

The total distance between Montreal and Quebec is 160 miles. The length requiring dredging between Longue Point, the eastern limit of Montreal Harbour and Quebec Harbour, is about 62½ miles.



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COST OF SHIP CHANNEL TO DATE.

TABLE showing the Total Cost of the Dredging and Plant and the Quantities Dredged up to June 30, 1903.

	Cost of Dredging.	Expenditure for plant, shops, surveys, &c.	Quantities dredged.
<i>Montreal Harbour Commissioners—1851 to 1888.</i>	\$      cts.	\$      cts.	Cubic yards.
Dredging Montreal to Cap à la Roche to 27½ feet at ordinary low water, and from Cap à la Roche to Quebec to 27½ feet at half tide.....	3,402,494 35	534,809 65	19,865,693
<i>Department of Public Works.</i>			
Dredging, consisting of widening and cleaning up of channel, deepening Cap à la Roche to Cap Charles to 27½ feet at ordinary low water and dredging at Grondines, Lotbinière and Ste. Croix—1889 to June 30, 1899.....	829,583 08	486,971 79	3,558,733
Present Project:—Dredging channel between Montreal and Quebec to 30 feet at lowest water of 1897 ; also widening to a minimum width of 450 feet and straightening—			
Fiscal year 1899-1900.....	100,191 01	265,270 78	1,107,894
"      1900-01.....	136,680 83	287,040 04	2,479,385
"      1901-02.....	185,429 80	479,731 47	3,098,350
"      1902-03.....	255,776 55	277,703 50	6,544,605
	4,910,155 62	2,331,527 23	36,654,660

PROGRESS of the Dredging Operations at the date of writing, the close of the season of 1903.

Locality.	Total Length Requiring Dredging.	Length Dredged in 1903.	Total Length of 30 Feet Channel Dredged.	Length yet to be Dredged.
	Miles.	Miles.	Miles.	Miles.
Division 1 :— Montreal Harbour to Sorel.....	21·80	4·20	21·80	Some cleaning up and banks to be straighten- ed. 7·55
Division 2 :— Sorel to Batiscan .....	12·45	1·20	4·90	
Division 3 :— Lake St. Peter .....	18·00	3·50 *	{ *7·20 +2·30 }	8·50
Division 4 :— Batiscan to Quebec .....	10·00	.....	0·90	9·10
	62·25	8·90	37·10	25·15

\*Not widened. +Widened.



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From Batiscan to Quebec the tide is available, and by taking advantage of it, vessels of heavier draught may pass.

During the summer of 1903 the practical completion of Division 1 was announced. This gives a channel between Sorel anchorage and Longue Pointe, the eastern limit of Montreal harbour, of a depth of 30 feet at the extreme low water level reached in 1897, and having a minimum width of 450 feet.

In the 40 miles of navigation between these two points there are now but 16 tangents, joined by easy curves where the channel is widened to from 500 to 750 feet.

*Division 1 Opened for Navigation.*

In the month of October, 1903, the dredging in Division 1 having been practically completed, and the work thoroughly tested, it remained for the Department of Marine and Fisheries to give the necessary aids to navigation so as to make the improved highway fully available.

In anticipation, this department had early in the season reported on the position and character of the lighthouses that would be required to permanently mark the channel as designed.

The Department of Marine and Fisheries promptly erected the necessary lighthouses and made further preparations so as to be ready to mark the channel as soon as completed.

On November 1 the lighthouses were put in operation, and gas buoys were placed to mark the bends and narrow places.

The benefit to navigation was immediately apparent. In the month of November, when time was of great value, several large ships, instead of anchoring at Sorel, took advantage of the improved and well-marked channel, and proceeded to Montreal, safely making their docks before midnight.

It is not expected that the large transatlantic ships outward bound will sail from Montreal during the night. The time for sailing for these large vessels is usually fixed in advance. Coal ships, however, and other vessels of light draught, will be able to sail from Montreal in clear weather at any time when they are ready. Inward bound ships will be able to avail themselves of the improvements throughout the channel as soon as completed.

The utility of the work done on the River St. Lawrence is evident. Advantage of every improvement is immediately taken, and at the present time several very large ships are being built with a view to the expected increased accommodation.



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ESTIMATE, 30 Foot Channel, December, 1903.—Montreal Harbour to Quebec.

Locality.	LENGTH OF DREDGING.		Cubic Yards yet required to be done.
	Required.	Done.	
	Miles.	Miles.	
Division 1 :—			
Longue Pte. to Pte. aux Trembles (en haut) . . . . .		5·05	Some cleaning up and banks to be straighten- ed.
Ile Ste. Thérèse . . . . .		0·40	
Varennés to Cap St. Michel. . . . .		3·00	
Cap St. Michel to Vercheres. . . . .		4·50	
Verchères Traverse . . . . .		1·10	
Verchères to Contrecoeur . . . . .		1·70	
Contrecoeur channel . . . . .		6·05	
Total . . . . .		21·80	
Division 2 :—			
Sorel to Ile de Grace. . . . .	1·20	3·20	500,000
Stone Island. . . . .		1·10	
Ile au Raisin. . . . .	0·25		40,000
Lake St. Peter (see 3). . . . .			
Port St. Francis. . . . .	0·40	0·10	350,000
Three Rivers. . . . .		0·50	
Cap Madeleine to Becancour. . . . .	1·55		620,000
Becancour to Champlain. . . . .	2·25		2,000,000
Champlain to Pte. Citrouille. . . . .	1·30		290,000
Batture Perron. . . . .	0·60		450,000
Total. . . . .	7·55	4·90	4,250,000
Division 3 :—			
Lake St. Peter. . . . .	8·05	{ *7·20 †2·30 }	13,900,000
Total. . . . .	8·05	9·50	13,900,000
Division 4 :—			
Batiscan to Cap Levrant . . . . .	3·00		1,300,000
Cap à la Roche channel. . . . .	2·00		1,200,000
Pouillier Rayer. . . . .	1·20		500,000
Cap Charles. . . . .	0·90		500,000
Grondines. . . . .	0·80		200,000
Lotbinière. . . . .		0·40	
Cap Santé. . . . .		0·20	
Ste. Croix. . . . .	0·60	0·30	150,000
St. Augustin. . . . .	0·60		150,000
Total. . . . .	9·10	0·90	4,000,000
Totals. . . . .	25·15	37·10	22,150,000

\*Not widened. †Widened.

DREDGES.

*Lady Aberdeen.*—The buckets of this dredge were designed for soft material. She worked for the whole fiscal year at Contrecoeur, in soft to stiff blue clay with small stones.

A total of 192 days were made. During this time the dredge was in actual operation 74 per cent of the full working time.

The total number of cubic yards removed amounted to 982,750, at a cost of \$32,-287.23, or an average of 3·28 cents.

*Lady Minto.*—Dredge ‘Lady Minto’ also worked during the whole of the fiscal year at different places on the Contrecoeur channel.

The working time of the year was 190 days, and the dredge was in operation 72 per cent of the full time.



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Considering the kind of material and the state of her machinery, this dredge made very satisfactory progress.

The quantity removed amounted to 643,600 cubic yards, and at the total cost of \$30,652.48 the cost per yard was 4.76 cents.

*Laurier.*—The 'Laurier' was also designed for soft digging. The material at Point aux Trembles, where this dredge worked during the whole fiscal year, was very tough and sticky. The results, as regards quantities removed, were unsatisfactory; but the work, although difficult and hard on the dredge, had to be done.

The spring repairs delayed the commencement of the operations of this dredge in April, 1903, and the number of days during which this dredge worked was only 172, and the percentage of time of actual work 60 per cent.

The total number of cubic yards dredged during the year was 365,630, and the cost \$31,861.19, or 8.71 cents per yard.

*Laval.*—At the commencement of the fiscal year this dredge was at Sorel for repairs to one of her boilers.

For 10 days she then worked at Champlain, removing the sand bars, which require dredging annually. This is the only place where filling in of any consequence occurs in the ship channel.

On July 20 the dredge was taken to her usual work at Pointe aux Trembles (*en haut*), where she continued until the close of the season, November 27.

In 1903, the 'Laval' having heavy repairs to be made, was not ready for work until May 20. She was again placed at Pointe aux Trembles, and worked there until June 17, when she was taken to Champlain and Pointe Citrouille, where the work was nearly completed at the close of the fiscal year.

During 1903, the total number of days working, this dredge was in actual operation 66 per cent of the full working time.

The total quantity dredged amounted to 273,425 cubic yards, and the total cost \$37,342.62, or 13.65 cents per yard.

*Lafontaine.*—This vessel is probably the best dredger of her type in the world for ordinary soft or stiff material, in fair shelter, and a current not greater than 6 miles per hour, and a depth not exceeding 45 feet. It is probable that for clean work, general results, and economy, the record of this dredge cannot be beaten by any other machine.

During the fiscal year 1902-3, under Captain Albert Marcotte and Engineer Johnny Matte, this dredge made three new records for an elevator dredge.

The greatest number of working days for one year, viz., 196, were made, and although by reason of the long season, bad weather, repairs, &c., the dredge was only in actual operation 60 per cent of the full working time, the results were very satisfactory, being the greatest quantity ever excavated by an elevator dredge in one year, viz., 1,162,500 cubic yards. The whole of the work was on the Contrecoeur channel, where the material was compact blue clay.

At a total cost for the year of \$33,503.71, the cost per yard for the work of this dredge was 2.88 cents, also a record.

*Baldwin.*—Dredge 'Baldwin' is the newest vessel of the elevator fleet. She worked throughout the fiscal year at Pointe aux Trembles (*en haut*).

This dredge also made a long year, viz., 191 days, and during that time was in actual operation 76 per cent of the full working time.

The material was not actually hard, but it was tough and excessively hard on the machinery. Nothing but a new dredge and extremely strong buckets would have stood the constant and heavy duty this vessel was given.

Considering the material, excellent progress was made. At a total cost for the year of \$32,282.81, the 'Baldwin' removed 783,500 cubic yards, costing only 4.12 cents per yard.

*J. Israel Tarte.*—The hydraulic dredge 'J. Israel Tarte' is the newest machine of the River St. Lawrence ship channel dredging fleet. This dredge commenced work in June, 1902, and the work for the fiscal year 1902-3 is practically her first work.



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The work in hand consists in deepening the present channel in Lake St. Peter about 4 feet, *i.e.*, from 27½ feet at ordinary low water level to 30 feet at the extreme low water of 1897.

At the curves, where the lightships could not be removed far from their positions, the channel was also widened at the same time.

It was then found that, except in the very long tangents, it was economy to complete the work of deepening and widening at the same time.

Mr. L. A. Desy, mechanical engineer, had charge of the working of this dredge, having under him Captain J. L. Michaud and Engineer Jean Bilodeau.

There is no question but that this type of dredge is very successful for such work as is required in Lake St. Peter, if it can be kept in steady operation.

During the first season a great deal of time was lost owing to trouble with the discharge pipe. This was overcome by the placing during the winter of strong tension ball-and-socket connections between the pontoons, and by a swivel connection with the dredge.

During the winter the whole of the machinery of the dredge received a general overhauling, and many changes were made, effecting greater strength. Steam drums were placed on the four boilers, and more powerful winches were added.

Although, owing to these extensive alterations, the dredge was not ready to work in 1903 until the beginning of June, the improvements made a marked change in the results of the operations. There was no further trouble with the discharge pipe, and very little time was lost, even during moderate gales.

To obtain good results the dredge was, however, forced to the limit of her capacity, and there were still frequent breakdowns.

As all repairs, and everything except re-construction, are charged to the season's work, the cost per yard depends largely on the length of the season. During the fiscal year this dredge worked only 127 days. If the dredge could have been kept in operation for 150 days, as expected, the total quantity excavated would have been greater and the cost per yard even better.

The actual operations for the fiscal year resulted in the removal of 2,333,200 cubic yards, at a cost of \$57,846.51, making 2.48 cents per yard. The average quantity dredged per day amounted to 18,372 cubic yards.

*During the month of September, 1903, dredge 'J. Israel Tarte' easily made the world's record for one month's dredging. In 25 working days the dredge was in actual operation 83 per cent of the full working time of 132 hours per week, and removed 750,100 cubic yards scow measurement. These results were calculated from actual measured cross-sections, and by adding to the quantity in situ 25 per cent, to make scow measurement. This made over 30,000 cubic yards per working day, or 1,650 yards per hour of actual work.*

*The dredge 'J. Israel Tarte' was disabled on November 3, 1903, by a disastrous accident to one of her boilers.*

#### General Notes.

The plant available consisted of six elevator dredges, one hydraulic dredge, six tugs, and two staff and sweeping steamers. There was also a stone-lifter, three coal barges, and the necessary hopper scows, boarding scows, winch scows, and the testing scow.

The constant heavy work day and night is very hard on the machinery, and all the dredges were stopped from time to time, for shafts worn out, tumblers broken, and especially for buckets broken.

The hopper scows also caused more delay and trouble than usual, owing to wear and tear, the heavy material and heavy work.

The elevator dredges ordinarily work from 12 a.m. Monday until 6 p.m. Saturday, 20 hours per day, or 115 hours per week.



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Two full crews work in 10 hour shifts, changing at noon and midnight. Day and night work is not as economical as day work only, especially in dredging, as coaling and repairs stop the work.

In making up the cost of the work of dredging everything is included, except interest on the capital expenditure and depreciation. The principal items of cost are, wages, fuel, board, stores, repairs, superintendence and engineering expenses. The item of repairs includes keeping the plant in constant good repair. The cost of operating an elevator dredge with its attendant plant amounts to about \$32,000 per annum. The cost of operating the hydraulic dredge will amount to about \$60,000 per annum.

The total cost of the dredging operations on the ship channel for the fiscal year was \$255,776.55, and the total number of cubic yards dredged 6,544,605, making the cost per yard 3.9 cents. *This easily beats all previous records, both as to quantity dredged and the cost per cubic yard.*

The following tables show in a concise form the details of the operations of the different dredges, the classification of the expenditure, the cost per yard in each locality, and the expenditure at Sorel in connection with new plant and the ship yard generally.

## SOREL SHIP YARD.

The chief items of construction and repair work at the Sorel shipyard during the fiscal year, as reported by Mr. G. J. Desbarats, Director of Shipyard, were as follows :—

*New Construction.*

*Dredge W. S. Fielding.*—This is a steel, twin screw, sea-going, combined elevator and hydraulic hopper dredge.

The hull is 250 feet by 42 feet by 18 feet.

The keel was laid in the spring of 1902, and the work of construction proceeded throughout the fiscal year.

The hull, deck houses, frames, winches, hoppers, &c., are being constructed at the Sorel shipyard from designs by A. W. Robinson, M.E., of Montreal.

By the end of the fiscal year all the frames were in place, the outside plating and the plating of the well, and of the hoppers were in place and rivetted and caulked. The plating of the main deck was in place and half of it rivetted. The foundations of the engines were finished and the boilers were placed and fastened to their foundations. The hopper gates were nearly completed. The two main propelling engines were delivered at Sorel. The bow and stern winches were under way and a quantity of patterns and castings had been made for different portions of the dredge and were partly machined.

The marine engines, the boilers and the pumping engine were being constructed by contract.

*Dredge Progress.*—This is a spoon dredge with a  $4\frac{1}{2}$  cubic yard dipper for excavating to a depth of 24 feet. The hull is of composite type, steel frames sheathed with pitch pine.

The hull is 90 feet 10 inches by 34 feet 2 inches by 10 feet 1 inch.

The hull commenced in July, 1902, was launched in November. The dredge was almost completed and ready for work at the end of the fiscal year. There remained condensers and tanks to be fitted aboard to make the dredge available for work in salt water.

*Tug James Howden.*—The twin screw tug with a hull of oak and pitch pine was built to attend dredges. In the spring of 1903, when this tug was about completed, it was found necessary to fit her up for the work of sweeping the channel, and on May 14, 1903, she was put into commission.



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This tug with engines and boiler complete was constructed in Sorel at the government shipyard.

The hull is 100 feet by 21 feet by 10 feet.

*Tug No. 9.*—A light draught powerful tug is required for work in shallow places. The engines of the old tug *John Pratt* were taken in hand to be fitted up for the new vessel. A new hull was built and nearly completed by the end of the fiscal year. The boiler was well begun, and the tug was expected to be ready for work by the end of the season of 1903.

*Coal Barge No. 4.*—Another short coal barge for coaling dredges without stopping the work was commenced during the fiscal year 1902-03. The framing was completed and erected by the end of June.

*D.G.S. Bayfield.*—This steamer, formerly the *Lord Stanley*, was purchased by the Department of Marine and Fisheries, and rebuilt and fitted up for a surveying ship at Sorel.

During the winter 1902-03 a new spar deck was built covering the whole vessel. The steel framing and plating of the bow were extended to meet the spar deck. On the main deck new houses were built fore and aft, and on the spar deck a handsome wheel house and chart room were erected. Sleeping apartments for the engineering staff were built in the after hold, and for the crew in the forward hold and the fore-castle. An electric light plant was installed. The ship was thoroughly overhauled throughout, painted, and put in first class condition.

*Dredge J. Israel Tarte.*—The experience of the first season's operations of this dredge resulted in a number of changes being made to her construction and improvement. During the winter of 1902-03 important alterations were made to the suction pipe and the discharge pipe. The exit from the dredge was changed and a swivel elbow joint was attached on the outside to allow the pipe line to swing freely. Steam drums were placed on all the boilers. New bow and stern winches were provided and a general overhauling was given to the dredge throughout.

Extensive alterations and improvements were made to the pipe line and the pontoon connections, and the method of attaching the pipe line to the winch scow was changed.

*Hopper Scows.*—For the use of the ship channel dredging fleet a large hopper scow, commenced during the last fiscal year, was finished in July, 1902. This scow, 99 feet by 26 feet by 9 feet, capable of holding 300 cubic yards was provided with hydraulic cylinders for operating the gates.

Another similar scow was commenced during the fiscal year.

Two hopper scows 60 feet by 17 feet by 9 feet, with a capacity of 90 cubic yards each, for the Ontario and Quebec dredging fleet, were completed.

Dredges *St. Louis*, *Nithsdale* and *Canal No. 1*, belonging to the Ontario and Quebec dredging fleet, were kept in repair, and repairs were made and new parts provided for Dredge No. 6 at Quebec, and for the *St. Maurice* fleet.

The winter repairs and outfitting of 60 vessels was all carefully completed.

During the trials of the Lacoste ship brake attachment, the Steamer *Eureka* sank accidentally on June 25, opposite the shipyard at Sorel, and was floated on July 1.

*Shipyard.*—During the fiscal year the shipyard was enlarged by the addition of a block of land transferred from the Department of the Interior.

Several old buildings were demolished and storehouses for wintering the equipment of the fleet, were constructed. A large shed was built and a plumber shop equipped with the necessary appliances.

The shop and yard narrow gauge railway was completed, and the lighting equipment improved, general repairs were made where required, and the buildings, wharfs and equipment kept in good order.



## DREDGING PLANT.

The following is a description of the dredging plant owned and operated by the Public Works Department in connection with the River St. Lawrence ship channel between Quebec and Montreal.

## DREDGES.

*The Elevator Dredge 'Laval' (wooden hull).*

Length over all—150 feet.  
Breadth of beam—30 feet.  
Depth of hold—14 feet.  
Average draught—11 feet.  
Greatest working depth—43'5 feet.  
Hull built in Ottawa in 1894.  
Working capacity per day in hard material—1,000 to 2,000 cubic yards

*The Elevator Dredge 'Laurier' (wooden hull).*

Length over all—168 feet.  
Breadth of beam—32 feet.  
Depth of hold—14 feet.  
Average draught—11 feet.  
Greatest working depth—42'5 feet.  
Built at Sorel shipyard in 1897.  
Working capacity per day in fairly stiff clay—2,000 to 3,000 cubic yards.

*The Elevator Dredge 'Lady Aberdeen' (steel hull).*

Length over all—148 feet.  
Breadth of beam—32 feet.  
Depth of hold—13 feet.  
Average draught—7'5 feet.  
Greatest working depth—42'5 feet.  
Built at Sorel shipyard in 1900.  
Working capacity per day in soft material—4,000 to 5,000 cubic yards.

*The Elevator Dredge 'Lady Minto' (steel hull).*

Length over all—148 feet.  
Breadth of beam—32 feet.  
Depth of hold—13 feet.  
Average draught—7'5 feet.  
Greatest working depth—42'5 feet.  
Built at Sorel shipyard in 1900.  
Working capacity per day in stiff clay and stones—2,000 to 4,000 cubic yards.

*The Elevator Dredge 'Lafontaine' (wooden hull).*

Length over all—168 feet.  
Breadth of beam—32 feet.  
Depth of hold—14 feet.



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Average draught—9 feet.

Greatest working depth—45 feet.

Built at Sorel shipyard in 1901.

Working capacity per day in soft material—5,000 to 6,000 cubic yards.

*The Elevator Dredge 'Baldwin' (wooden hull).*

Length over all—165 feet.

Breadth of beam—34 feet.

Depth of hold—14 feet.

Average draught—8 feet.

Greatest working depth—45 feet.

Built at Sorel shipyard in 1902.

Working capacity per day in medium material—2,500 to 3,500 cubic yards.

*The Hydraulic Dredge 'J. Israel Tarte' (steel hull).*

Length over all—160 feet.

Breadth of beam—42 feet.

Depth of hold—12.5 feet.

Average draught—6 feet.

Length of suction frame—80 feet.

Greatest working depth—50 feet.

Built at the Polson Iron Works, Toronto, in 1902.

Working capacity per day in soft material—20,000 cubic yards.

TUGS.

*The Tug 'Frontenac' (composite hull).*

Length over all—113 feet.

Breadth of beam—23 feet.

Depth of hold—10 feet.

Average draught—9 feet.

Built at Sorel shipyard in 1901.

*The Tug 'Eureka' (steel hull).*

Length over all—100 feet.

Breadth of beam—22 feet.

Depth of hold—12 feet.

Average draught—11 feet.

Built in Glasgow, Scotland, in 1893.

*The Tug 'De Lévis' (wooden hull).*

Length over all—104 feet.

Breadth of beam—20 feet.

Depth of hold—10 feet.

Average draught—9 feet.

Built at Sorel shipyard in 1902.

*The Tug 'James Howden' (wooden hull).*

Length over all—100 feet.

Breadth of beam—21 feet.

Depth of hold—10 feet.

Average draught—7.5 feet.

Built at Sorel shipyard in 1903.



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*The Tug 'St. Jean-Iberville' (steel hull).*

Length over all—90 feet.  
Breadth of beam—18 feet.  
Depth of hold—12 feet.  
Average draught—10 feet.  
Built at Sorel shipyard in 1897.

*The Tug 'Lac St. Pierre' (wooden hull).*

Length over all—100 feet.  
Breadth of beam—21 feet.  
Depth of hold—10 feet.  
Average draught—7'6 feet.  
Built at Sorel shipyard in 1901.

*The Tug 'St. Francis' (wooden hull).*

Length over all—80 feet.  
Breadth of beam—17 feet.  
Depth of hold—7'8 feet.  
Average draught—9 feet.  
Built in 1875.

*The Tug 'Cartier' (wooden hull).*

Length over all—84 feet.  
Breadth of beam—18 feet.  
Depth of hold—8'5 feet.  
Average draught—8 feet.  
Built at Sorel shipyard in 1893..

*The Tug 'Emilia' (wooden hull).*

Length over all—84 feet.  
Breadth of beam—17 feet.  
Depth of hold—9 feet.  
Average draught—7'5 feet.  
Built at Sorel shipyard in 1898.

*The Tug 'Champlain' (wooden hull).*

Length over all—84 feet.  
Breadth of beam—17 feet.  
Depth of hold—9 feet.  
Average draught—7'5 feet.  
Built at Sorel shipyard in 1901.

*The Tug 'Jessie Hume' (wooden hull).*

Length over all—72 feet.  
Breadth of beam—17'3 feet.  
Depth of hold—8 feet.  
Average draught—8'5 feet.  
Built in Buffalo in 1878.



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## COAL BARGES.

*The coal barge 'No. 1' (wooden hull).*

Length over all—120 feet.  
Breadth of beam—24 feet.  
Depth of hold—10 feet.  
Built at Sorel shipyard in 1898.

*The coal barge 'No. 2' (wooden hull).*

Length over all—125 feet.  
Breadth of beam—25 feet.  
Depth of hold—11 feet.  
Built at Sorel shipyard in 1900.

*The coal barge 'No. 3' (wooden hull).*

Length over all—98 feet.  
Breadth of beam—28 feet.  
Depth of hold—12 feet.  
Built at Sorel shipyard in 1902.

*Stone Lifter 'No. 2' (wooden hull).*

Length over all—80 feet.  
Breadth of beam—25 feet.  
Depth of hold—9'8 feet.  
Rebuilt at Sorel shipyard in 1897.

*Sounding Scow (wooden hull).*

Length over all—60 feet.  
Breadth of beam—25 feet.  
Depth of hold—6 feet.  
Built at Sorel shipyard in 1898.

*Coal Scow 'No. 2' (wooden hull).*

Length over all—54 feet.  
Breadth of beam—18 feet.  
Depth of hold—4 feet.  
Built at Sorel shipyard in 1892.

*Six Lodging Scows (wooden hulls).*

Rebuilt from old dump scows and fitted out as lodging scows for crews of dredges and tugs of ship channel fleet, at Sorel shipyard in 1899, 1901 and 1902.

*House boat 'Lotbinière (wooden hull).*

Length over all—70 feet.  
Breadth of beam—18 feet.  
Rebuilt from old dump scow, and fitted out for staff of Hydrographic Survey at Sorel shipyard in 1902.



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*Winch Scow 'N. 3' (wooden hull).*

Length over all—60 feet.  
Breadth of beam—18 feet.  
Depth of hold—6 feet.  
Built at Sorel shipyard in 1902.

*Winch Scow (wooden hull) for dredge 'J. Israel Tarte' (with steam boiler and steam winch).*

Length over all—75 feet.  
Breadth of beam—25 feet.  
Depth of hold—5'5 feet.  
Built at Sorel shipyard in 1902.

*Discharge Pipe and pontoons of Dredge 'J. Israel Tarte.'*

23 lengths of pipe—36 inches diameter by 100 feet long.  
1 length of pipe—36 inches diameter by 35 feet long.  
23 pairs of pontoons for floating pipes—42 inches diameter by 90 feet long.

## HOPPER SCOWS.

*Two Hopper Scows (wooden hulls—with hydraulic power for closing gates).*

Length over all—97 feet.  
Breadth of beam—24'5 feet.  
Depth of hold—9 feet.  
Capacity—200 cubic yards.  
Built at Sorel shipyard in 1897.

*Two Hopper Scows (wooden hulls—with hydraulic power for closing gates).*

Length over all—90 feet.  
Breadth of beam—18 feet.  
Depth of hold—7 feet.  
Capacity—150 cubic yards.  
Built at Sorel shipyard in 1898.

*Four Hopper Scows (wooden hulls—with hydraulic power for closing gates).*

Length over all—97 feet.  
Breadth of beam—24 feet.  
Depth of hold—9 feet.  
Capacity—200 cubic yards.  
Built at Sorel shipyard in 1899 and 1901.

*Five Hopper Scows (wooden hulls—with hydraulic power for closing gates).*

Length over all—98 feet.  
Breadth of beam—24 feet.  
Depth of hold—9'5 feet.  
Capacity—300 cubic yards.  
Built at Sorel shipyard—2 in 1901, 3 in 1902.



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PUBLIC WORKS OF CANADA.

RIVER ST. LAWRENCE SHIP CHANNEL.

Abstract of work of Dredging Fleet during the fiscal year ended June 30, 1903.

Dredge.	Locality of Dredging.	Time of Service.	Nominal Working Time 20 hrs. per Day.	Hours Actual Dredging.	Number of Scows filled.	Number of Cubic yards Dredged. Scow Measurement.	Depth of Dredging at low water of 1897.	Width.	Character of Soil.	Remarks.
		Days.	Hours.				Ft. In.	Feet.		
'Lady Aberdeen'	Contrecoeur—									
	Contrecoeur Bend..	28	540	391½	932	186,400	30 0	450-550	Blue clay.....	{ Capt. N. Dauphinais.
	St. Ours Traverse.....	125	2,405	1,781½	.....	627,550	30 0	450	Clay and stones.....	
	Petit Traverse....	39	745	563½	844	168,800	30 0	450	Stiff blue clay. ....	
		192	3,690	2,736½	.....	982,750				
'Lady Minto'	Contrecoeur—									
	Petit Traverse.....	56	1,070	784½	972½	194,500	30 0	450	Stiff blue clay.....	{ Capt. R. Matte.
	Contrecoeur Traverse.....	134	2,575	1,831½	2,245½	449,100	30 0	450	Blue clay and stones	
		190	3,645	2,615½	3,217½	643,600				
'Laurier' ..	Pointe aux Trembles (en haut).	172	3,305	1,989½	1,778	365,630	30 0	450	Clay and stones.....	Capt. C. Gendron.
'Laval' ..	Pointe aux Trembles .....	134	2,572	1,777½	1,542½	247,175	30 0	450	Clay and stones.....	{ Capt. B. Ladebauche.
	Pointe Citrouille ..	20	380	254	153	22,950	27 6	300	Sand.....	
	Champlain.....	1	20	18½	22	3,300	27 6	300	" .....	
		155	2,972	2,050	1,717½	273,425				
'Lafontaine'	Contrecoeur—									
	Contrecoeur Course.....	96	1,845	1,140	1,663	498,900	30 0	450	Blue clay.....	{ Capt. A. Marcotte.
	Contrecoeur Bend..	24	450	321½	675	202,500	30 0	450	" .....	
	Upper ½ Bellmouth Curve...	44	845	483½	906	271,800	30 0	450	" .....	
	Petit Traverse.....	32	640	447½	631	189,300	30	450	" .....	
		196	3,780	2,392½	3,875	1,162,500				



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Pointe aux Trembles (en haut).	191	3,528	2,670½	2,702½	783,500	30 0	450	Clay and stones.....	Capt. Louis Dauphinais.
'Baldwin'									
'J. Israel'									
'Tarte'									
Lake St. Peter—									
White Bend to No. 2 Curve..	.....	.....	.....	.....	1,867,500	30 0	325	Soft blue clay.....	{ L. N. Desy, Mec. Eng.
No. 2 Curve..	.....	.....	.....	.....	465,700	30 0	325-500	" " .....	
					2,333,200				
					6,544,605				







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[illegible]



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DREDGING SHIP CHANNEL, River St. Lawrence between Montreal and Quebec, Classification of Disbursements, &c.—Continued.

DETAILS OF DREDGING, LOCALITY AND COST PER CUBIC YARD.

Dredges.	Total cost of operations of each dredge and plant, during fiscal year.	Number of days in operation, each dredge.	Cost per day. Operations of dredge and plant.	Days working each locality.	Cost of work of each Locality.	Total cost of operations of each dredge.	Number of cubic yards dredged each locality.	Total cubic yards for each dredge.	Cost per cubic yard. Each locality.	Average cost per cubic Yard for each Dredge.	Kind of material dredged.	Locality of dredging.	
	\$ cts.		\$ cts.		\$ cts.	\$ cts.			Cts.				
Dredge Lady Aberdeen.	32,287 23	192	168 16	28	4,708 55	.....	186,400	.....	2 <sup>52</sup> / <sub>100</sub>	.....	Blue clay.....	Contrecoeur Bend.	
"	.....	.....	168 16	125	21,020 33	.....	627,550	.....	3 <sup>35</sup> / <sub>100</sub>	.....	Clay and stones.	" St. Ours Trav.	
"	.....	.....	168 16	39	6,558 35	.....	168,800	.....	3 <sup>88</sup> / <sub>100</sub>	.....	Stiff blue clay...	" Petit Trav.	
Dredge Lady Minto....	.....	.....	.....	.....	.....	32,287 23	.....	982,750	.....	3 <sup>28</sup> / <sub>100</sub>	.....	"	"
"	30,652 48	190	161 33	56	9,034 42	.....	194,500	.....	4 <sup>54</sup> / <sub>100</sub>	.....	"	"	"
"	.....	.....	161 33	134	21,618 06	.....	449,100	.....	4 <sup>81</sup> / <sub>100</sub>	.....	Blue clay, stones	" Traverse.	
Dredge Laurier.....	.....	.....	.....	.....	.....	30,652 48	.....	643,600	.....	4 <sup>76</sup> / <sub>100</sub>	.....	"	"
"	31,861 19	172	185 24	172	31,861 19	.....	365,630	.....	8 <sup>71</sup> / <sub>100</sub>	.....	Clay and stones.	Pteaux Trembles(haut)	
Dredge Laval.....	.....	.....	.....	.....	.....	31,861 19	.....	365,630	.....	8 <sup>71</sup> / <sub>100</sub>	.....	"	"
"	37,342 62	155	240 92	134	32,283 30	.....	247,175	.....	13 <sup>06</sup> / <sub>100</sub>	.....	"	Pte aux Trembles(haut)	
"	.....	.....	240 92	21	5,059 32	.....	26,250	.....	19 <sup>27</sup> / <sub>100</sub>	.....	Sand.....	Pte Citrouille.	
Dredge Lafontaine....	.....	.....	.....	.....	.....	37,342 62	.....	273,425	.....	13 <sup>65</sup> / <sub>100</sub>	.....	"	"
"	33,503 71	196	170 94	96	16,410 00	.....	498,900	.....	3 <sup>29</sup> / <sub>100</sub>	.....	Blue clay.....	Contrecoeur Course.	
"	.....	.....	170 94	24	4,102 48	.....	202,500	.....	2 <sup>02</sup> / <sub>100</sub>	.....	"	" Bend.	
"	.....	.....	170 94	44	7,521 23	.....	271,800	.....	2 <sup>76</sup> / <sub>100</sub>	.....	"	" Bellmouth.	
"	.....	.....	170 94	32	5,470 00	.....	189,300	.....	2 <sup>88</sup> / <sub>100</sub>	.....	"	" Petit Trav.	
Dredge Baldwin.....	.....	.....	.....	.....	.....	33,503 71	.....	1,162,500	.....	2 <sup>88</sup> / <sub>100</sub>	.....	"	"
"	32,282 81	191	169 02	191	32,282 81	.....	783,500	.....	4 <sup>12</sup> / <sub>100</sub>	.....	Clay and stones.	Pteaux Trembles(haut)	
Dredge J. Israël Tarte.	.....	.....	.....	.....	.....	32,282 81	.....	783,500	.....	4 <sup>12</sup> / <sub>100</sub>	.....	"	"
"	57,846 51	127	455 48	103	46,914 88	.....	1,867,500	.....	2 <sup>81</sup> / <sub>100</sub>	.....	Soft blue clay...	Lake St. Peter Wh. B.	
"	.....	.....	.....	24	10,931 63	.....	465,700	.....	2 <sup>35</sup> / <sub>100</sub>	.....	"	to No. 1 Curve	
"	.....	.....	.....	.....	.....	57,846 51	.....	2,333,200	.....	2 <sup>48</sup> / <sub>100</sub>	"	" No. 2 "	
Totals.....	255,776 55	1,223	.....	1,223	255,776 55	255,776 55	6,544,605	6,544,605	.....	.....	.....	"	



## PROVINCE OF QUEBEC.

## DREDGING BATISCAN RIVER.

Batiscan river, on the north shore of the St. Lawrence, below Three Rivers

The dredging was continued in the eastern channel from the railway bridge down.

Eight thousand nine hundred and ninety-six lineal feet of the channel was dredged to four feet at low water, and 81,389 cubic yards of sand, clay and stone materials were removed.

Expenditure during fiscal year, \$9,826.14.

## DREDGING AT THE BLANCHE SHOALS, OTTAWA RIVER.

From July 1 to November 19, 1902, the close of navigation, the dredge *T. F. M. No. 1* worked in this river on the Blanche shoals, on the eastern end of the inside channel, near the lighthouse. Three cuts were made, 2,800 feet in length, to a depth of 12 feet; 44,760 cubic yards of clay, sand and stone were removed. To complete the straightway of the channel it will require at least one whole season's work.

## DREDGING AT BOUCHERVILLE ISLAND.

The dredge *Otto*, of the Canadian Construction Company, worked since July 2 to September 20 included, to complete the dredging of the channel between Ile de la Commune and Ile Grosbois, opposite Boucherville, to the outer islands. The channel has a width of 50 feet by a depth of 6 feet at the lowest water.

18,570 cubic yards of blue clay were removed at a cost of \$3,646.

The dredge has worked since September 22 to October 18 included, north of Isle Grosbois, to open up a channel for a ferry line from Pointe aux Trembles to Ile Grosbois.

4,680 cubic yards of clay were removed at a cost of \$456.

## DREDGING AT BOUCHERVILLE.

Between September 11 and October 9, 1902, the dredge *Nithsdale* commenced work at the shoal west of the island, opposite Boucherville, making one cut 700 feet long, and one 600 feet long, to a depth of 10 feet at low water, and removing 6,331 cubic yards of sand, mud and boulders.

## DREDGING IN THE CHATEAUGUAY RIVER.

The dredge *Little Giant* worked at this place between July 1 and August 4, 1902, deepening and widening the mouth of the river to 9 feet below low water. 5,000 cubic yards of hardpan, clay and boulders were removed.

The dredge *Nithsdale* also worked at this place from October 28 to November 18, 1902, the close of navigation, dredging at the western outlet and removing 2,450 cubic yards of sand, mud and boulders. This dredge and plant was then towed to Sorel, and laid up for the winter.

This dredge resumed operations at this place on May 13, 1903, and continued up to June 30, 1903, the close of the fiscal year, making three cuts through the boulder shoal in the channel, 450 feet long each, 25 feet wide and 9 feet deep. Another cut was also



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made through a sandbar in the main channel, 700 feet long, 25 feet wide and 9 feet at low water. 10,320 cubic yards of hardpan, clay and sand were removed.

Owing to the severity of the spring freshets, dredging will be required at this place almost every season.

## DREDGING AT COTEAU LANDING.

Dredges *No. 4* and *No. 5* worked at this place between July 2 and August 7, completing the channel through the boulder shoal leading to the new elevator, to a depth of 16 feet at low water. The material removed consisted of 9,885 cubic yards of clay and boulders.

This material was removed by contract.

## DREDGING AT DOUCET'S LANDING.

Doucet's Landing, on the south shore of the St. Lawrence, opposite Three Rivers.

Dredging was done on the eastern side of the wharf at Doucet's Landing.

Two thousand and fifty lineal feet of the channel was dredged to 8 feet at low water, and 12,390 cubic yards of sand, clay and stone were removed.

Expenditure during fiscal year, \$1,677.50.

## DREDGING AT GRENVILLE.

The dredge *T.F.M. No. 1* worked at this place from July 2 to 8, 1902, widening the turning basin at the entrance of the canal, dredging to a depth of 12 feet at low water. The total quantity of material removed was 3,700 cubic yards of sand and clay.

The new dredge *Richelieu* also worked at this place between June 22 and 30, 1903, the close of the fiscal year. One cut was made north of the canal, opposite Dansereau's mill, 136 feet long, 22 feet wide and 8 feet deep below zero. The quantity of material removed was 1,260 cubic yards of gray sand.

## DREDGING AT GRAHAM.

Between May 19 and June 30, 1903, the close of the fiscal year, the dredge *T.F.M. No. 1* worked at this place, making one cut running east of Graham's wharf, 1,800 feet long, 22 feet wide and 6 feet deep. One cut on the east side of the wharf, 80 feet long, 22 feet wide and 8 feet deep; 13,560 cubic yards of hardpan and clay were removed.

## DREDGING AT LACHINE.

Dredge *No. 4* (Moore) worked at this place between July 2 and 14, 1902. The work done was at Dawes' wharf, and consisted of one cut 785 feet long, to a depth of 10 feet, but owing to the rock bottom the dredge was not capable of completing all the work required. The material removed consisted of 1,495 cubic yards of hardpan, sand, gravel and boulders.

## DREDGING IN LAKE TIMISKAMING.

The new dredge *Queen*, which was completed in fall of 1902, worked at New Lisheard between May 29 and June 30, 1903, the end of the fiscal year. Two cuts were made, one 750 feet long, 26 feet wide and 8 feet deep in the old channel through a clay bar. The other cut is situated in front of the wharf, 145 feet long, 26 feet wide and 8 feet deep at low water, to enable vessels to turn. The material removed at this place was 5,245 cubic yards of clay.



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## DREDGING AT LAVALTRIE.

The dredge *Nithsdale* worked at this place from July 1 up to August 12, 1902, deepening in front of the Richelieu and St. Lawrence wharfs, to 8 feet at low water, 6 cuts were made, 150 feet long, and 25 feet wide. The material removed consisted of 12,670 cubic yards of sand, mud and boulders.

## DREDGING AT NICOLET.

Dredge *Nithsdale* worked at this place between April 20 and May 9, 1903, making one cut 1,000 feet long, 25 feet wide and 9 feet deep at low water, starting from the wharf in a northerly direction alongside the breakwater. The material removed consisted of 6,055 cubic yards of sand and clay.

## DREDGING NICOLET RIVER.

The River Nicolet empties into the St. Lawrence on its southern shore, at the foot of Lake St. Peter.

In order to protect the schooners loading in the harbour from the force of storms on Lake St. Peter, a jetty was commenced in 1881.

Some dredging was done in the channel along the jetty, the quantity removed amounting to 18,590 cubic yards of sand, clay and stone materials.

Expenditure during fiscal year, \$3,999.27.

## DREDGING AT NICHOLAS ISLAND.

The dredge *Little Giant* worked at this place between August 5 and September 20, 1902. A boulder shoal in Lake St. Louis, which obstructed navigation, was removed. Dredging was done to a depth of 12 feet below low water. The quantity of material removed consisted of 4,325 cubic yards of hardpan, clay and boulders.

The dredge *Nithsdale* also worked at this place between October 10 and 27, 1902, on the boulder shoal in front of Nicholas Island, making one cut 175 feet long, and one cut 127 feet long to a depth of 15 feet at low water, and removing 697 cubic yards of sand, mud and boulders.

## DREDGING AT NOTRE DAME DE PIERREVILLE.

Dredging was done at this place by the dredge *St. Louis* from July 1, to November 18, 1902, the close of navigation. The work done consisted of widening and deepening the channel on the St. Francis river. The quantity of material removed consisted of 20,880 cubic yards of sand. To complete the whole of the work asked for at this place will require at least three season's dredging. The dredge and plant were then towed to Sorel and laid up for the winter.

The same dredge resumed operations on May 4, 1903, and continued up to June 30, the close of the fiscal year, making four cuts in the channel, 473, 384, 249 and 445 feet long, and one cut in the channel at the Tourville Mills 690 feet long, all to a width of 25 feet. The quantity of material removed was 7,795 cubic yards of sand.

## DREDGING AT PAPINEAUVILLE.

The dredge *T. F. M. No. 1* commenced operations at this place on July 15, 1902, and continued up to the 31st of the same month, on the channel leading from the Ottawa river to Papineauville bay, making two cuts 1,035 and 345 feet long, respectively, to a depth of 10 feet at low water. The material removed consisted of 7,780 cubic yards of clay, sand and stone.



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## DREDGING AT POINTE, CLAIRE.

The dredge *No. 4* (Moore) started work at this place on July 15, and continued there up to August 14, 1902, deepening and widening the approach to the wharf to a depth of 10 feet at low water. This dredge also worked at this place from October 17 to November 18, the close of navigation, continuing the widening and deepening of the channel leading to the wharf. The total quantity of material removed was 15,990 cubic yards of hardpan, clay, gravel and boulders.

## DREDGING IN THE RICHELIEU RIVER.

Dredging operations were performed on this river by the dredge *Canals No. 1*, between July 1 and November 15, 1902, the close of navigation, at the following places:— Deepening the channel opposite the barracks to 10 feet at low water. One cut was made 1,274 feet long, and three shorter cuts averaging 800 feet in length; 4,260 cubic yards of hardpan and boulders were removed.

The plant was then taken to Iberville and worked on the channel leading from St. John, and along the wharfs at that place. The material removed consisted of 1,200 cubic yards of hardpan and boulders. Work was then resumed in the harbour of St. John, and continued up to the end of the season, removing 15,270 cubic yards of hardpan and boulders.

The dredge was then towed to Ottawa and dismantled, being found in such a shaky condition that it was decided to remove the machinery and build a new hull.

## DREDGING IN THE RIVER JESUS.

Dredge *Otto* worked at this place from June 11 to 30, 1903, the close of the fiscal year, making one cut 1,085 feet long, 21 feet wide, and 6 feet deep at low water. The work consisted in making an entrance from the main channel to McDonald's wharf. The quantity of material removed consisted of 3,475 cubic yards of boulders, clay and sand.

## DREDGING IN THE RIVIÈRE DU NORD (ST. ANDREWS).

Between August 13 and October 16, 1902, the dredge *No. 4* (Moore) worked at this place with the stonelifter, making a channel through the boulder shoal leading to the landing at St. Andrew's, Que., to a depth of 10 feet at low water; 4,273 cubic yards of hardpan, clay, gravel and boulders were removed.

## DREDGING AT ROBERVAL.

The dredge *P. V. Savard* worked at this place between July 14 and October 11, 1902, making a depth of 6 feet around the wharf and at the entrance of the harbour.

The total quantity of material removed was 9,805 cubic yards of clay and sawdust. Some delay was occasioned through necessary repairs to the dredge and tug.

The expenditure, including repairs before the beginning of operations, amounted to \$2,531.45.

## DREDGING AT SOREL.

The dredge *Nithsdale* worked at this place between August 14 and September 10, 1902, deepening in front of the government wharf to 12 feet at low water. The quantity of material removed consisted of 8,050 cubic yards of sand, mud and boulders.

## DREDGING AT ST. MAURICE RIVER.

The River S. Maurice flows southward and empties into the St. Lawrence at Three Rivers.



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From Grandes Piles up to La Tuque, a distance of 66 miles, there is a good channel for vessels drawing less than two feet six inches of water.

During the high water the type of the dredge *St. Maurice* was changed from a clam shell to a bucket.

*Pointe à Trudel*, on the 3rd mile above Grande Piles.—The dredging performed last year having filled in considerably the dredge was put at work on August 4, and 2,690 cubic yards of sand and gravel were removed, making a channel 44 feet wide and 970 feet in length. This work was completed on August 19.

*Ile aux Morpions*, on the 9th mile.—The channel dredged last year having filled in considerably, the dredge resumed work on August 21, where 5,255 cubic yards of sand, gravel, clay and puddle were removed, making a channel 40 feet wide by 1,072 feet in length. The work was completed on September 24.

*Mekinac Shoal*, on the 14th mile.—The dredge was removed to that place on September 25, where the boats cannot go beyond at low water. The dredging was discontinued on October 30, 1902.

Three thousand four hundred and forty-five cubic yards of gravel, clay and puddle were removed, making a channel 40 feet by 804 feet in length.

\$7,760.01 is the total expenditure for the fiscal year 1902-03.

Some dredging was also done at the outlet of the eastern channel by the dredge *St. Pierre*. The work was commenced on July 21, and discontinued on October 25, 1902.

Thirty nine thousand and thirty cubic yards of sand, clay and boulders were removed from the channel 7,100 feet in length.

\$6,137.50 is the total expenditure for the year 1902-03.

## DREDGING AT THREE RIVERS.

From April 25 to May 3, 1903, the dredge *St. Pierre* worked to remove a small shoal opposite the *St. Maurice Lumber Company's* wharf at Three Rivers.

Six hundred and eighty feet of the channel were dredged to 8 feet at low water, and 3,640 cubic yards of sand and clay materials were removed.

\$572.50 is the total expenditure for the season 1903.

## DREDGING AT VALLEYFIELD.

Between July 2 and October 4, 1902, the dredge *No. 4* (Daly) was working at this place, completing the channel leading to the cotton mills. Two cuts were made 865 feet long, to a depth of 10 feet at low water. The material removed consisted of 21,225 cubic yards of stone.

## PROVINCE OF ONTARIO.

## DREDGING AT ADOLPHUSTOWN.

The dredge *Sir Richard* was working at this place on July 1, 1902, and continued there up to the 13th of the same month finishing the dredging required at the town wharf. The total quantity of material removed at this place consisted of 800 cubic yards of sand. The work performed enabled the passengers and freight steamers to approach the wharfs and unload their cargoes.



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## DREDGING AT BOWMANVILLE.

The dredge *Nipissing* continued the work at this place, between July 1 and 12, 1902, deepening between the piers and through the bars at the entrance to the harbour, to a depth of 14 feet below low water. It also worked at this place between July 30 and September 22, 1902, deepening and widening the entrance to the piers and along between the piers from the lighthouse to the coal sheds. The total quantity of material removed consisted of 30,300 cubic yards of hard sand and clay. Since the sheet piling was done to the east pier, the work done by the dredge has been more satisfactory, but dredging will be required at this port from time to time, owing to the wash of sand from the lake during heavy seas.

## DREDGING AT COLLINGWOOD.

Dredging was performed at this place by the dredge *Challenge* from July 1, 1902, to the close of navigation. Two cuts were made along the south side of Charlton's dock 400 feet long, 25 feet wide, and one cut along the north side 375 feet long, 25 feet wide, all to an average depth of 12 feet at low water. On August 28 the plant was removed to the entrance of the dry dock and worked there up to the end of October, when orders were given to commence work on the shoal running from the freight shed to the dry dock, where work was continued up to November 18, the close of navigation. Considerable lost time was experienced at this place, owing to the repeated breakages caused by the hard nature of the material to be dredged. The quantity of material removed at this place consisted of 24,155 cubic yards of hardpan, clay, stone and boulders.

Dredge *Challenge* resumed work at this place, at Charlton's mill, on May 28, and continued to June 30, the close of the fiscal year. One cut was made on south side of lumber piles 540 feet long, 25 feet wide, and to a depth of from 10 to 15 feet. Another cut was made back of lumber piles and running into mill pond 291 feet long, 25 feet wide, and ranging in depth from 14 to 15 feet of water. Two other cuts on each side of the slab dock were made, 372 and 282 feet long, 25 feet wide, ranging in depth from 10 to 13 feet. The quantity of material removed at this place consisted of 7,020 cubic yards of boulders, hardpan, clay and sand.

## DREDGING AT COBOURG.

The dredge *Sir Richard* worked at this place between July 16 and November 18, 1902, the close of navigation. The work consisted of two cuts along the west or middle pier 2,000 feet long, to a depth of 15 feet at low water. Also from abreast of the lighthouse, on the east pier, extending 416 feet inside of harbour, leaving the channel inside of harbour 120 feet wide and 15 feet deep at low water. A small ridge about 100 feet long and 20 feet wide was removed inside the inner breakwater. The material removed at this place consisted of 32,825 cubic yards of hard packed sand.

Cobourg harbour being one of the most important harbours on Lake Ontario, about three months' dredging should yet be done to complete the work required.

## DREDGING AT FORT WILLIAM.

The entrance channel to River Kaministiquia was widened and deepened in places to a depth of 22 feet below zero of gauge; also in the river opposite the Imperial oil dock and C.P.R. Elevators B and C.

A turning basin was made at the junction of the Kaministiquia and Mission rivers to a depth of 19 feet below zero.

Above the C.P.R. Elevator D to the Canadian Northern Railway's coal dock at West Fort William the channel has been deepened and widened in places, and when



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completed will give a channel 125 feet in width, with a minimum depth of 18 feet 6 inches below zero.

The total amount dredged was 333,425 cubic yards, at a cost of \$59,504.91.

## DREDGING AT GANANOQUE.

Dredging operations were performed at this place by the dredge *No. 4 Cohen* from May 15 to June 30, the close of the fiscal year, deepening the channel in the Gananoque river to a depth of 10 feet, and along the front of Rathbun's dock to a depth of 14 feet, removing 14,500 cubic yards of clay, sand, sawdust and slabs.

This work was still being performed at the close of the fiscal year.

## DREDGING AT GODERICH.

During the fiscal year 1902-3 dredging was done at the entrance of the harbour in order to keep the channel to a depth of 20 feet, and also alongside of the lumber dock, to allow vessels of 12 to 14 feet draught to approach it and unload.

The materials consisted of loose rock, gravel and clay, and the amount removed was 91,668 cubic yards at a cost of \$12,543.71, or 13.69 cents per cubic yard.

During the season of 1902 the dredge was occupied 257 hours and 25 minutes, at a cost of \$2,059.33, redredging sand which had drifted into the deepened entrance channel by the action of the fall and spring storms; and during the past season of 1903 the dredge was again occupied at the same place, and for the same reason, 273 hours and 50 minutes, at a cost of \$2,190.66, and under the present condition of the entrance to the harbour it will obviously be necessary to do the same amount of dredging from year to year in order to keep the channel at its present depth of 20 feet.

## DREDGING AT HAWKESBURY.

Dredging at this place was performed by the dredge *Little Giant* between September 26, 1902, and the close of navigation. The work consisted in widening and deepening the channel from the Ottawa river to the wharfs at Hawkesbury, to a depth of 9 feet at low water. The material removed consisted of 17,755 cubic yards of hardpan, clay and boulders.

On May 8 this dredge resumed operations at this place and continued up to June 30, 1903, the close of the fiscal year. The work consisted in the continuation of the widening and deepening of the channel from the Ottawa river to the wharfs at Hawkesbury. The material removed consisted of 17,575 cubic yards of hardpan and boulders.

## DREDGING AT KINGSVILLE.

Dredging was done at this place by the dredge *Ontario* between July 1 and September 20, deepening and widening the channel through the sand bar which forms at the entrance to the harbour. A channel was completed between the piers, 400 feet long, 100 feet wide, to a depth of 12 feet at low water. The material removed consisted of 24,560 cubic yards of fine sand, quick sand, clay and boulders. While a good entrance to the harbour for immediate requirements was made, about 2 or 3 months dredging is yet needed to make this harbour a suitable one for the shipping interests at this place. Owing to the cribwork in the piers being built to a depth of 14 feet, dredging cannot be safely carried on to a greater depth than 12 feet.

## DREDGING IN THE KAMINISTIGUIA RIVER.

The dredge *Arthur* worked at this place from July 2 to September 27, 1902. Three cuts 1,500 feet long, 22 feet deep were made in the channel leading to the mouth of the river, one cut 75 feet long and 22 feet deep was made west of the first buoy. Two cuts,



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1,500 and 400 feet long, 22 feet deep, were made along the front of the new coal dock, and one cut 600 feet long on the north side opposite the new coal dock. The material removed consisted of 40,762 cubic yards of clay and sand.

Dredge *No. 6* also worked at this place between July 2 and November 29, 1902, the close of navigation, deepening the channel in the Kaministiquia river to 22 feet. The material removed consisted of 237,475 cubic yards of sand, mud, clay and stone.

## DREDGING AT KINGSTON.

Between May 7 and June 30, 1903, the close of the fiscal year, the dredge *Sir Richard* worked at this place making two cuts, one 785 feet long, 30 feet wide, and 14 feet deep at low water, making an approach to and along the front of the K. & P. railway wharf. The second cut was 560 feet long, 25 feet wide and 14 feet deep, running parallel with first cut towards the swing bridge. Both these cuts have a channel 55 feet wide and 14 feet deep at low water; 16,725 cubic yards of hardpan, boulders and clay were removed.

## DREDGING AT NEWCASTLE.

The dredge *Nipissing* worked at this place between July 14 and 29, 1902. The work done consisted of deepening the channel along the west side of the east pier, to allow the grain and coal vessels an entrance to unload their cargoes. 8,625 cubic yards of sand were removed. The work done proved satisfactory for present requirements.

## DREDGING AT PICKERING.

Dredging was performed at this place by the dredge *Nipissing* between September 26 and November 18, the close of navigation. One cut was made along the west side of the east pier, from about 200 feet outside the full length of the pier, and to about 500 inside the harbour to a depth of 14 feet at low water. Two cuts were also made along the front of the ice-house, about 600 feet long, 25 feet wide, and to a depth of about 14 feet. The quantity of material removed consisted of 22,838 cubic yards of sand and clay.

## DREDGING AT PORT ARTHUR.

Contractor C. S. Boone's dredge *Kingsford* commenced dredging in the harbour on August 18, 1902, starting from the opening at breakwater going towards the C.P.R. wharf, and the Great Lakes dredging company's dredges *No. 5* and *Arthur* commenced on September 29 from the same place going towards the C.N.R. elevator wharf, and continued until the close of navigation. Work was resumed in the harbour by the above named dredges in the spring. Some dredging has been done in the channel outside of the breakwater.

The total amount dredged during the fiscal year ending June 30, 1903, was 155,990 cubic yards (scow measurement), at a cost of \$29,146.02.

## DREDGING AT PORT HOPE.

Work at this place was done by the dredge *Nipissing* between April 23 and June 30, 1903, the close of the fiscal year. Four cuts were made at the main entrance of the harbour, 350, 700, 700 and 550 feet long, 25 feet wide, and 14 feet deep at low water. Two cuts were made at the entrance to the old harbour 400 and 600 feet long, 25 feet wide and 14 feet deep; two cuts were also made inside the new harbour, 300 feet long each, 25 feet wide, and 12 feet deep; these two cuts could not be dredged to 14 feet as the bottom consisted of shell rock. The material removed at this place was 26,287 cubic yards of mud, sand, clay and stone, boulders and hardpan.

Blasting operations must be performed at this place before the whole work required can be completed.



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## DREDGING AT PRESCOTT.

M. A. Cleveland's dredge *D. Stewart* with necessary plant started dredging on June 23, at lower C.P.R., coal dock, and was still in operation at the end of the fiscal year.

## DREDGING AT RONDEAU.

The dredge *Ontario* started work at this place on September 22, 1902, on the bar outside the piers, making one cut 700 feet long, 25 feet wide and 19 feet deep, and one cut 125 feet long to the same depth. These make a channel 700 feet long, 50 feet wide and 19 feet deep through the bar, out to 17 feet of water below zero in the lake. To reach 19 feet of water at the lake end it will require an extension of this channel, at least 300 feet. Three cuts were also made through the shoal between the piers, 350 feet each, and one cut 150 feet long, to a depth of 19 feet at low water. A channel leading to the Lake Erie and Detroit River railway dock was also made 350 feet long, 75 feet wide and 14 feet deep; two cuts were also made inside the new harbour, 300 feet long each, 25 feet wide and 12 feet deep; these two cuts could not be dredged to 14 feet, as the bottom consisted of shell rock. The material removed at this place was 26,287 cubic yards of mud, sand, clay and stone, boulders and hardpan.

This port being a harbour of refuge would require at least three or four months' dredging to meet the requirements.

The dredge *Ontario* again worked at this place between May 11 and June 30, the end of the fiscal year. Removing the bar outside of the piers and two shoals between the piers. Four cuts were made, 650, 650, 425 and 100 feet long, and 17 feet deep at extreme low water through the bar. This work was practically the removal of material which filled up during the past winter. This gives a channel 650 feet long, 125 feet wide and 12 feet deep. Four other cuts were made, one of 340 feet and three of 250 feet long, 19 feet deep and 100 feet wide on a shoal which forms yearly between the piers. Part of an old crib between the piers was also removed. Another cut was also made on the east side of the west pier which was left unfinished last year, 100 feet long, 25 feet wide and 19 feet deep. The quantity of material removed was 16,390 cubic yards of sand.

## DREDGING AT WOLFE ISLAND.

The channel cut across the Blanket shoal was instituted to provide an alternate entrance to the St. Lawrence river from Lake Ontario for freight vessels of 14 feet draft plying between the upper lake ports and the ocean ports of the lower St. Lawrence river, permitting them to cross to the American channel—which is the only one lighted and buoyed at present for traffic—at the foot of Wolfe island, and thus escape passing the dangerous Charity shoals that lay off the south-west of Wolfe island in Lake Ontario, and which they would be obliged to do in entering or leaving the river by the south entrance.

These shoals have been the cause of several large wrecks during the past few years; they are sunken ledges of rock, and at present defined by an American gas buoy and two spar buoys. They are in Canadian territory.

Up to the present time vessels of 14 feet draught have been obliged to confine their route to the south entrance, or the American channel, at the foot of Wolfe island, except in stages of very high water.

The cut is 300 feet wide on the bottom, nearly a mile in length, and 18 feet deep at lowest known water level.

It is defined by a black spar buoy at the north end, and a red gas buoy at the south end.

Operations were commenced August 20, 1902, by R. Macdonald's dredge No. 5—later replaced by No. 6—and the necessary plant, and continued until December 6, 1902.



The work was laid out on lines determined from a survey of the locality made in 1900. In February, 1903, a hydrographic survey in close uniform sections was made of the entire locality from the ice, and the final boundaries of the cut closely defined.

Dredging started with the same plant on April 13, 1902, and continued in operation at the close of the fiscal year.

The original appropriation, granted last year for this work, was \$10,000, and at the session of Parliament of 1903 an additional amount of \$8,000 was granted to complete the work, making a total of \$18,000.

Cubic yards removed to date, 96,600.

Expenditure for same, \$14,300.

Cost per cubic yard (scow measurement), \$0.1479. Material running from soft silt and fine sand to stiff blue clay and cemented gravel or hardpan.

STATEMENT of Expenditure and quantities of material removed by the various Dredges, at different localities, in Ontario and Quebec, during the fiscal year ended June 30, 1903.

Dredge.	Location.	Yards removed.	Character of Soil.	Expenditure.	Cost per yard.
Challenge.....	Collingwood... ..	31,175	H. pan, sand, blds. & clay...	\$ 7,757 12	cts. 24 <sup>9</sup> / <sub>16</sub>
Ontario.....	Kingsville.....	24,560	Clay and quick sand.....	8,257 34	13 <sup>3</sup> / <sub>16</sub>
" .....	Rondeau.. ..	38,360	Sand and gravel.....		
Nipissing.....	Bowmanville.. ..	30,300	Hardpan.....	8,819 08	10 <sup>1</sup> / <sub>16</sub>
" .....	Newcastle .....	8,625	Clay and sand.....		
" .....	Pickering .....	22,838	Rock and mud.....		
" .....	Port Hope.....	26,287	Rock and mud... ..		
Sir Richard.....	Adolphustown.....	800	Sand .....	13,078 32	26
" .....	Cobourg.....	32,825	Hardpan and boulders.....		
" .....	Kingston .....	16,725	Clay.....		
Queen.....	Temiskamingue.....	5,245	Sand and clay.....	1,029 66	19 <sup>1</sup> / <sub>2</sub>
Richelieu.....	Grenville. ....	1,260	Gray sand.....	624 35	49 <sup>1</sup> / <sub>2</sub>
St. Louis.. ....	Notre-DamedePierreville	28,675	Sand .....	3,086 66	10 <sup>1</sup> / <sub>4</sub>
Canals No. 1.....	St. Johns.....	19,530	Hardpan and boulders. ...	3,790 53	18 <sup>1</sup> / <sub>4</sub>
" .....	Iberville ... ..	1,200	" .....		
Nithsdale .....	St. Ignace .....	105	Sand, clay, boulders... ..	12,395 48	26 <sup>1</sup> / <sub>2</sub>
" .....	Lavaltrie .....	12,670	Mud and stone.....		
" .....	Sorel. ....	8,050	" .....		
" .....	Boucherville .....	6,331	" .....		
" .....	Nicholas Island.....	697	" .....		
" .....	Nicolet... ..	6,055	" .....		
" .....	Chateauguay.....	12,770	" .....		



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STATEMENT of Expenditure.—*Continued.*

Dredge.	Location.	Yards removed.	Character of Soil.	Expenditure.	Cost per yard.
				\$ cts.	cts.
T. F. M. No. 1....	Papineauville.....	7,780	Clay, hardpan, sand & stone.	12,644 49	18 $\frac{3}{25}$
" ..	Blanche shoals.....	44,760	" " :		
" ....	Graham.....	13,560	" " :		
" ....	Grenville.....	3,700	" " :		
Little Giant.....	Chateauguay.....	5,000	Clay.....	15,322 45	34 $\frac{1}{2}$
" ..	Nicholas Island.....	4,325	Hardpan.....		
" ....	Hawkesbury.....	35,330	Boulders and stone.....		
No. 4 (Daly) ....	Valleyfield.....	21,225	Rock and stone.....	6,446 00	30 $\frac{9}{25}$
Otto .....	River Jesus.....	3,475	Clay, sand and gravel.....	1,098 00	31 $\frac{3}{5}$
No. 4 (Moore)....	Lachine.....	1,495	Clay and hardpan.....	11,587 20	53 $\frac{1}{2}$
" .....	Pointe Claire.....	15,990	" " .....		
" .....	St. Andrews.....	4,273	" " .....		
No. 4 (Cohen)....	Gananoque .....	14,500	Blds., clay and gravel....	3,326 35	23
Nos. 4 & 5.....	Coteau Landing.....	9,885	Boulders and clay.....	2,668 40	27
No. 6. ....	Kaministiquia... ..	237.475	Clay, mud and sand.....	35,696 25	15
Kingsford .. ....	Port Arthur.....	50,955	Clay, mud and sand.....	7,793 35	15 $\frac{1}{2}$
Arthur.. ....	Kaministiquia .....	40,762	Clay and sand.....	6,945 90	15 $\frac{3}{20}$
" .....	Port Arthur.....	5,086	" .....		
No. 5.....	Port Arthur .....	46,080	Sand, mud and clay.....	6,912 00	15



CLASSIFICATION OF DISBURSEMENTS OF the Dredges during the Year ended 30th June, 1903.  
DREDGE 'CHALLENGE.'

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	420 00	420 00	407 58	414 76	316 00	30 00	30 00	.....	112 37	315 65	283 23	1,717 64	4,467 23
Coal.....	.....	190 82	290 10	331 46	332 81	56 00	.....	.....	.....	.....	.....	388 90	1,590 09
Provisions.....	.....	113 00	168 75	65 60	193 41	.....	.....	.....	.....	38 48	.....	201 96	781 20
Stores.....	30 00	33 00	24 82	9 43	6 23	15 06	.....	.....	.....	76 50	.....	117 81	312 85
Equipment.....	.....	.....	.....	.....	.....	.....	8 03	.....	.....	27 50	.....	50 33	85 86
Repairs.....	.....	46 07	4 89	68 84	49 38	7 29	.....	.....	.....	73 55	.....	156 97	406 99
Contingencies.....	.....	.....	.....	3 98	.....	52 88	.....	.....	.....	28 51	.....	27 53	112 90
Totals.....	450 00	802 89	896 14	894 07	897 83	161 23	38 03	.....	112 37	560 19	-283 23	2,661 14	7,757 12
Working expenses.....	450 00	756 82	891 25	825 23	848 45	153 94	38 03	.....	112 37	486 64	283 23	2,504 17	7,350 13
Repairs, ordinary.....	.....	46 07	4 89	68 84	49 38	7 29	.....	.....	.....	73 55	.....	156 97	406 99
Totals.....	450 00	802 89	896 14	894 07	897 83	161 23	38 03	.....	112 37	560 19	283 23	2,661 14	7,757 12

DREDGE 'ONTARIO.'

	411 13	413 60	410 84	413 97	336 17	17 47	30 00	.....	224 02	395 08	402 91	811 36	3,866 55
Wages.....	.....	.....	174 00	109 20	211 05	.....	191 75	.....	.....	.....	.....	441 14	1,482 24
Coal.....	355 10	.....	108 48	109 33	196 41	.....	.....	.....	.....	.....	.....	333 67	966 01
Provisions.....	108 67	109 45	74 24	15 07	14 80	7 36	.....	.....	.....	46 07	.....	91 37	331 00
Stores.....	26 91	55 18	.....	5 00	.....	.....	.....	.....	.....	.....	.....	.....	357 54
Equipment.....	5 65	346 89	.....	2 55	25 51	22 53	.....	.....	.....	179 61	.....	830 76	1,086 02
Repairs.....	.....	15 82	9 30	17 25	.....	64 46	6 50	.....	.....	.....	.....	62 70	168 18
Contingencies.....	.....	17 27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	907 46	958 21	776 86	672 37	783 94	111 82	228 25	.....	224 02	620 76	402 91	2,570 94	8,257 54
Working expenses.....	907 46	942 39	767 56	669 82	758 43	89 29	228 25	.....	224 02	441 15	402 91	1,740 24	7,171 52
Repairs, ordinary.....	.....	15 82	9 30	2 55	25 51	22 53	.....	.....	.....	179 61	.....	830 70	1,086 02
Totals.....	907 46	958 21	776 86	672 37	783 94	111 82	228 25	.....	224 02	620 76	402 91	2,570 94	8,257 54



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DREDGE 'NIPISSING.'

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	375 00	375 00	367 83	365 00	365 00	473 04	160 00	.....	154 20	349 83	474 09	784 00	4,242 95
Coal.....	.....	451 09	374 80	.....	481 66	.....	.....	.....	.....	363 05	.....	958 79	2,629 43
Provisions .....	.....	103 00	103 00	102 25	209 00	.....	.....	.....	.....	60 00	.....	248 84	826 09
Stores.....	45 11	9 07	6 75	17 37	18 04	5 50	12 18	.....	.....	131 44	.....	103 09	348 55
Equipment.....	.....	.....	.....	7 00	.....	.....	8 03	.....	.....	12 30	.....	.....	27 33
Repairs.....	.....	10 60	34 24	60 39	2 46	1 90	.....	.....	.....	233 77	.....	285 55	628 91
Contingencies. . .	.....	.....	7 84	21 05	8 19	25 45	.....	.....	.....	39 43	.....	13 86	115 82
Totals .....	420 11	948 76	894 46	573 06	1,084 35	505 89	180 21	.....	154 20	1,189 82	474 09	2,394 13	8,819 08
Working expenses....	420 11	938 16	860 22	512 67	1,081 89	503 99	180 21	.....	154 20	956 05	474 09	2,108 58	8,190 17
Repairs, ordinary. . .	.....	10 60	34 24	60 39	2 46	1 90	.....	.....	.....	233 77	.....	285 55	628 91
Totals .....	420 11	948 76	894 46	573 06	1,084 35	505 89	180 21	.....	154 20	1,189 82	474 09	2,394 13	8,819 08

DREDGE 'SIR RICHARD.'

Wages .....	465 00	370 00	345 00	437 92	386 67	506 24	90 65	30 00	172 35	518 22	381 29	890 46	4,693 80
Coal .....	78 20	575 00	.....	.....	505 45	.....	62 20	.....	.....	126 00	.....	451 23	1,798 08
Provisions .....	103 00	253 15	.....	99 17	206 63	.....	33 60	.....	.....	.....	.....	192 85	888 40
Stores.....	27 87	89 67	2 00	19 80	2 55	.....	109 65	.....	160 93	170 20	.....	80 91	663 58
Equipment .....	25 20	1,901 73	.....	.....	.....	.....	.....	.....	.....	29 37	.....	.....	1,956 30
Repairs .....	293 90	167 34	121 58	21 73	99 29	.....	227 48	.....	.....	314 68	51 57	888 92	2,186 49
Pilotage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15 00	15 00
Contingencies.....	65 96	23 60	4 45	2 64	.....	472 35	30 20	.....	.....	52 20	40 22	185 05	876 67
Totals.....	1,159 13	3,380 49	473 03	581 26	1,200 59	978 59	553 78	30 00	333 28	1,210 67	473 08	2,704 42	13,078 32
Working expenses....	865 23	3,213 15	351 45	559 53	1,101 30	978 59	326 30	30 00	333 28	895 99	421 51	1,815 50	10,891 83
Repairs, ordinary....	293 90	167 34	121 58	21 73	99 29	.....	227 48	.....	.....	314 68	51 57	888 92	2,186 49
Totals.....	1,159 13	3,380 49	473 03	581 26	1,200 59	978 59	553 78	30 00	333 28	1,210 67	473 08	2,704 42	13,078 32







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DREDGE 'ST. LOUIS.'

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	350 00	350 00	350 00	350 00	103 00	68 66				209 35	370 00	370 00	2,349 35
Provisions.....		103 15	103 00	103 00						36 00		206 30	723 11
Equipment.....													11 55
Repairs.....				7 95	3 10	0 50							
Contingencies.....						0 90						1 75	2 65
Totals.....	350 00	453 15	453 00	460 95	106 10	70 06				245 35	370 00	578 05	3,086 66
Working expenses.....	350 00	453 15	453 00	453 00	103 00	69 56				245 35	370 00	578 05	3,075 11
Repairs, ordinary.....				7 95	3 10	0 50							11 55
Totals.....	350 00	453 15	453 00	460 95	106 10	70 06				245 35	370 00	578 05	3,086 66

DREDGE CANALS 'No. 1.'

Wages.....	415 00	415 00	415 00	415 00	281 00							415 00	2,356 00
Coal.....		10 25	317 37	4 75	6 00	119 28							457 65
Provisions.....	110 00	110 00	110 00	110 00	110 00	91 34							641 34
Stores.....		15 35	11 34	10 06	5 46	4 13							46 34
Equipment.....				1 85									1 85
Repairs.....		4 42	45 71	98 19	3 49	27 34							179 15
Towage.....						7 00							7 00
Contingencies.....	60 00		11 00			26 95	3 25						101 20
Totals.....	585 00	555 02	910 42	639 85	405 95	276 04	3 25					415 00	3,790 53
Working Expenses.....	585 00	550 60	864 71	541 66	402 46	248 70	3 25					415 00	3,611 38
Repairs, ordinary.....		4 42	45 71	98 19	3 49	27 34							179 15
Totals.....	585 00	555 02	910 42	639 85	405 95	276 04	3 25					415 00	3,790 53



CLASSIFICATION OF DISBURSEMENTS OF the Dredges during the year ended June 30, 1903—Continued.

DREDGE "NITHSDALE."

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	375 00	378 00	378 00	386 00	59 00	33 00	.. .. .	.. .. .	.. .. .	211 37	392 00	398 00	2,610 37
Coal.....	.. .. .	.. .. .	.. .. .	2 40	.. .. .	.. .. .	2 00	.. .. .	.. .. .	.. .. .	.. .. .	2 50	6 90
Provisions .....	.. .. .	110 00	110 00	110 00	127 95	86 09	.. .. .	.. .. .	.. .. .	55 00	.. .. .	220 00	819 04
Stores.....	.. .. .	.. .. .	4 22	.. .. .	3 30	.. .. .	3 90	.. .. .	.. .. .	.. .. .	.. .. .	25 95	37 37
Repairs.....	.. .. .	.. .. .	.. .. .	.. .. .	4 80	.. .. .	.. .. .	.. .. .	.. .. .	1 50	.. .. .	.. .. .	6 30
Towage.....	.. .. .	.. .. .	.. .. .	.. .. .	20 00	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	20 00
Contingencies.....	1,240 00	1,240 00	1,200 00	1,240 00	850 50	5 00	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	3,120 00	8,895 50
Totals.....	1,615 00	1,728 00	1,692 22	1,738 40	1,065 55	124 09	5 90	.. .. .	.. .. .	267 87	392 00	3,766 45	12,395 48
Working expenses.....	1,615 00	1,728 00	1,692 22	1,738 40	1,060 75	124 09	5 90	.. .. .	.. .. .	266 37	392 00	3,766 45	12,389 18
Repairs, ordinary.....	.. .. .	.. .. .	.. .. .	.. .. .	4 80	.. .. .	.. .. .	.. .. .	.. .. .	1 50	.. .. .	.. .. .	6 30
Totals.....	1,615 00	1,728 00	1,692 22	1,738 40	1,065 55	124 09	5 90	.. .. .	.. .. .	267 87	392 00	3,766 45	12,395 48

DREDGE "T. F. M. No. 1."

Wages.....	84 00	78 00	78 00	81 00	54 00	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	45 00	123 00	543 00
Contingencies.....	1,713 45	2,006 34	2,074 50	2,148 00	1,200 00	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	3 15	2,956 05	12,101 49
Totals.....	1,797 45	2,084 34	2,152 50	2,229 00	1,254 00	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	48 15	3,079 05	12,644 49
Working expenses.....	1,797 45	2,084 34	2,152 50	2,229 00	1,254 00	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	48 15	3,079 05	12,644 49
Totals.....	1,797 45	2,084 34	2,152 50	2,229 00	1,254 00	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	48 15	3,079 05	12,644 49



# BREDGE 'LITTLE GIANT.'

[illegible]







## DREDGE No. 4 'COHEN &amp; SONS,'

	Wages.....	Equipment .....	Contingencies.....	Totals .....	105 00 15 3,222 20	105 00 15 3,221 20
Wages.....	.....	.....	.....	.....	105 00	105 00
Equipment .....	.....	.....	.....	.....	15	15
Contingencies.....	.....	.....	.....	.....	3,222 20	3,221 20
Totals .....	.....	.....	.....	.....	3,326 35	3,326 35
Working expenses....	.....	.....	.....	.....	3,326 35	3,326 35
Totals .....	.....	.....	.....	.....	3,326 35	3,326 35

## DREDGE No. 4 &amp; 5 'COTEAU LANDING.'

[illegible]

DREDGE NO. 6, 'BOWMAN & CO.'

Contingencies.....	8,629 50	8,134 50	6,695 25	5,888 85	6,348 15	.....	.....	.....	.....	.....
Totals. .... .	8,629 50	8,134 50	6,695 25	5,888 85	6,348 15	.....	.....	.....	.....	35,696 25
Working expenses ...	8,629 50	8,134 50	6,695 25	5,888 85	6,348 15	.....	.....	.....	.....	35,696 25
Totals ..... .	8,629 50	8,134 50	6,695 25	5,888 85	6,348 15	.....	.....	.....	.....	35,696 25







## SESSIONAL PAPER No. 19

## PROVINCE OF MANITOBA.

## DREDGING AT GYPSUMVILLE.

The dredge *Manitoba* was put to work at Gypsumville during the month of August of the season 1902, and worked until the latter end of September.

Some 9,677 cubic yards of hardpan and boulders were excavated, also a channel 50 feet wide at the shore end, and increasing in width to 70 feet outside was excavated.

The obstructions that were in the harbour, such as sunken piers, formerly built by the mining company, were also removed.

The amount of work, as well as the manner in which it was done, appeared to satisfy those interested in navigation, as it was much needed work. No work could be done with the dredge to deepen the channel through the reef south of Manitoba House, opposite Sandy Point without auxiliary tug power to insure the safety of the plant.

## DREDGING THE MOUTH OF RED RIVER.

All the dredging was done on the new channel, particularly the lake end of same, where the channel cuts across a sand bank that borders the lake shore. A good deal of time was lost going over the channel time and again, as large quantities of sand and clay mixed also some quick sand, kept running into the excavation after every blow from the north.

Owing to necessary repairs to be done to the dredging plant, the work was stopped on September 20, the dredge *Winnipeg*, which was doing this work, as well as the tug and scows, were thoroughly repaired during the winter, and the work of dredging the new channel was resumed June 1, 1903, and continued to the last of the same month. The width of the channel excavated averages 65 feet, and the depth of water 9 feet.

The amount of clay and sand removed was 48,710 cubic yards, at a cost of \$10,399.35, or 21½ cents per yard.

## DREDGING AT WHITE MUD RIVER.

The dredge *Manitoba* was towed to the mouth of the White Mud river September 20, 1902, but the lateness in the season, the rough and stormy weather, together with the want of fuel and tug power, necessitated abandoning the work, and laying up the plant into winter quarters. The work was, however, resumed in the spring of 1903, the channel at the mouth deepened, and a few of the bad bends of the river straightened.

Some dredging was also done at Mr. Barr's landing, and the river considerably improved, at all events, it appeared to satisfy those interested in its navigation. The material was all cast to one side, and in some cases handled twice in order to prevent any possibility of its running back into the excavation.

## REPAIRS TO DREDGING PLANT.

The work of repairs of both the dredges *Winnipeg* and *Manitoba* were proceeded with during the winter, and the sum of \$11,858.63 was expended in doing the said work.

The dredge *Winnipeg* had to be rebuilt from the bottom up, new masts, new anchor slides, spuds, &c.

The tugs *Sir Hector* and *Victoria* required some replanking, and a new coal barge 90 feet long, 20 feet wide, 5 feet high, was built with 6-inch side timbers, 8 by 8-inch frame, with three solid bulkheads.

The dredge *Manitoba* also needed new spuds, and recaulking. One of her scows was also completed, and converted into a regular dump scow with pockets, traps, rollers, &c.

Most of the timber used was oak, which was obtained at Brokenhead river.



DREDGE 'WINNIPEG.'

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	614 94	634 80	650 00	434 87	281 00	82 40					806 80	712 33	4,217 14
Coal.....	881 40	596 26	309 28	242 63								216 05	2,245 62
Wood.....	21 03											13 00	34 03
Provisions.....	341 44	284 14	202 85	78 85	20 05						117 20	231 35	1,275 88
Stores.....			8 95									38 70	47 65
Equipment.....	321 16	31 65	39 72	248 41							129 95	602 43	1,373 52
Repairs.....	7 75	28 69	41 50	14 89	12 65	8 25					228 96	517 99	860 68
Contingencies.....	98 28	25 40	33 00	62 75	18 90	25 16						81 54	345 03
Totals .....	2,286 00	1,600 94	1,285 30	1,082 40	332 60	115 81					1,282 91	2,413 39	10,399 35
Working expenses.....	2,278 25	1,572 25	1,243 80	1,067 51	319 95	107 56					1,053 95	1,895 40	9,538 67
Repairs, ordinary.....	7 75	28 69	41 50	14 89	12 65	8 25					228 96	517 99	860 68
Repairs, extraordinary.....													
Totals .....	2,286 00	1,600 94	1,285 30	1,082 40	332 60	115 81					1,282 91	2,413 39	10,399 35



CLASSIFICATION OF Disbursements of Dredges during the Year ended June 30, 1903.—*Con.*

DREDGE 'MANITOBA.'

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.....	692 65	444 64	458 00	478 09	82 10	80 00	80 60	86 40	84 90		623 50	964 00	4,074 88
Coal.....													
Wood.....			23 45	20 25					227 00		34 00	56 25	360 95
Provisions.....	332 38	36 25	186 39	93 79							42 82	154 28	845 91
Stores.....	133 86												133 86
Equipment.....	565 64	75 92	317 92	115 65					3 00		20 70		1,098 83
Repairs.....	956 83	103 60	5 40		119 79	84 50					3 42	149 63	1,423 17
Towage.....		25 00	220 00										245 00
Contingencies.....					86 00	5 75			22 50			184 25	298 50
Totals.....	2,681 36	685 41	1,211 16	707 78	287 89	170 25	80 60	86 40	337 40		724 44	1,508 41	8,481 10
Working expenses.....	1,724 53	581 81	1,205 76	707 78	168 10	85 75	80 60	86 40	337 40		721 02	1,358 78	7,057 93
Repairs, ordinary.....	956 83	103 60	5 40		119 79	84 50					3 42	149 63	1,423 17
Repairs, extraordinary.....													
Totals.....	2,681 36	685 41	1,211 16	707 78	287 89	170 25	80 60	86 40	337 40		724 44	1,508 41	8,481 10



BRITISH COLUMBIA.

DREDGING.

This service is possibly the most important of the department on this coast. It assimilates with the harbour and river appropriations where there is a special grant for those services. It embraces, when not chargeable to such special appropriations, the services of the hydraulic dredge *King Edward*, dipper dredge *Mud Lark*, with the steam tender and scows, dredge *Nakusp*, on the Arrow lakes, Columbia river, and snag boat *Samson*, aggregating an expenditure of nearly \$5,000 per month.

This would represent approximately \$60,000 annually for this service, which will be found to agree with the tabulated statement attached of the cost of the different dredges for the year, month and day, based on the returns for the past twelve months.

The expenditure in connection with the above service is as follows:—

Victoria Harbour .. . . .	\$ 3,999 60
Dredge <i>King Edward</i> .. . . .	17,541 85
“ <i>Mud Lark</i> .. . . .	4,767 87
Snag boat <i>Samson</i> .. . . .	8,281 28
	<hr/>
Total .. . . .	\$34,590 60

The above expenditure may be classified as follows:—

*Dredging Victoria Harbour.*

Wages .. . . .	\$2,416 78
Provisiones .. . . .	650 21
Material .. . . .	456 35
Coal .. . . .	440 62
Water .. . . .	8 00
Tug hire .. . . .	20 00
Contingencies .. . . .	7 64
	<hr/>
	\$ 3,999 60

*Dredge ‘King Edward.’*

Wages .. . . .	7,287 10
Provisions .. . . .	2,602 01
Material .. . . .	2,573 18
Coal .. . . .	4,986 46
Water .. . . .	32 19
Contingencies .. . . .	60 91
	<hr/>
	17,541 85

*Dredge ‘Mud Lark.’*

Wages .. . . .	2,830 79
Provisions .. . . .	649 71
Material .. . . .	383 00
Coal .. . . .	896 37
Contingencies .. . . .	8 00
	<hr/>
	4,767 87



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Snag Boat 'Samson.'

Wages.. . . .	\$ 5,650 00	
Provisions .. . . .	1,103 00	
Material .. . . .	616 10	
• Fuel .. . . .	825 70	
Water .. . . .	58 22	
Contingencies .. . . .	28 26	
	<hr/>	8,281 28
		\$34,590 60

DREDGE REPAIRS.

The expenditure on this service represents ordinary and extraordinary repairs to the dredges *King Edward* and *Mud Lark*, and snag boat *Samson*, the former representing the work of repairs done by the crews and engineers, and the latter those requiring outside assistance and beyond the scope of the ordinary crews.

It has already been represented that the dredge *Mud Lark* has about reached her limit of life, and the repairs are out of proportion to her value. The *Samson* is equally shaky, and a renewal of the dredging plant, together with a new tug and hopper scows, will soon be required in order to continue the service with any degree of economy and efficiency.

The following is the expenditure incurred for repairs on the different boats for the year ending June 30, 1903:—

Repairs *King Edward*—

Ordinary .. . . .	\$ 503 87	
Extraordinary .. . . .	1,261 96	
	<hr/>	\$1,765 83

Repairs snag boat—

Ordinary.. . . .	\$ 165 76	
	<hr/>	165 76

Repairs *Mud Lark*—

Ordinary.. . . .	\$ 411 98	
Extraordinary .. . . .	2,653 86	
	<hr/>	3,065 84

Total .. . . .	<hr/>	\$4,997 43
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STATEMENT showing expenses of the different dredges in British Columbia for the twelve months ending February 28th 1903, and cost per working day in wages, fuel and supplies.

DREDGE 'KING EDWARD', (18 MEN).

Month.	Wages.	Fuel.	Stores and Provisions.	Total.
1902.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
March . . . . .	938 54	24 50	552 92	1,515 96
April . . . . .	955 16	607 75	972 14	2,535 05
May . . . . .	911 42	135 00	1,270 85	3,347 21
June . . . . .	1,029 94			
July . . . . .	951 76	737 43	506 10	2,195 29
August . . . . .	1,025 00	703 50	826 86	3,555 36
September . . . . .	1,015 16	132 00	256 61	1,403 77
October . . . . .	1,024 67	746 02	834 54	2,605 23
November . . . . .	1,023 00	1,330 54	1,430 70	4,779 24
December . . . . .	995 00			
1903.				
January . . . . .	992 74	.. .. .	657 99	1,650 73
February . . . . .	982 14	1 119 00	844 65	2,945 79
Totals . . . . .	11,844 53	5,535 74	8,153 36	25,533 63

Average cost per month :—

Wages . . . . .	\$ 937 05
Fuel . . . . .	461 31
Stores and provisions . . . . .	679 45
Total . . . . .	\$2,127 80

Average cost per working day—312 per year :—

Wages . . . . .	\$ 37 96
Fuel . . . . .	17 74
Stores and provisions . . . . .	26 13
Total . . . . .	\$ 81 84



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## DREDGE 'MUD LARK' (14 MEN).

Month.	Wages.	Fuel.	Stores and Provisions.	Total.
1902.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
February.....	736 25	42 37	186 99	965 61
March.....	722 50	.....	128 17	850 73
April ... ..	720 34	261 00	528 45	1,509 79
May .....	707 90	} 192 50	554 97	2,247 70
June.....	792 33		236 82	1,046 82
July . . . . .	745 00	65 00	430 95	1,298 45
August.....	730 00	137 50	223 33	1,078 33
September.....	855 00	.....	246 95	1,348 00
October.....	840 50	260 55	341 54	1,131 20
November.. ..	789 66	.....	563 39	1,784 01
December.....	780 00	440 62		
1903.				
January.....	780 00	.....	490 07	1,270 07
Totals.....	9,199 48	1,399 54	3,931 63	14,530 71

## Average cost per month :—

Wages.....	\$ 766 62
Fuel.....	1,161 60
Stores and provisions.....	327 64
Total.....	1,210 89

## Average cost per working day—312 per year :—

Wages.....	\$ 29 49
Fuel.....	4 49
Stores and provisions.....	12 60
Total.....	46 57



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SNAG BOAT 'SAMSON' (9 MEN).

Month.	Wages.	Fuel.	Stores and Provisions.	Total.
1902.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
March .....	555 00	9 00	178 76	742 76
April .....	565 00	70 50	159 74	795 24
May .....	565 00	72 00	380 57	1,579 90
June .....	562 00			
July .....	565 00		315 07	880 07
August .....	565 00	311 80	212 03	1,078 83
September .....	565 00	32 50	123 63	721 13
October .....	565 00	32 50	248 26	845 76
November .....	565 00	143 50	292 56	1,566 06
December .....	565 00			
1903.				
January .....	565 00	48 75	136 20	749 95
February .....	565 00	62 75	175 07	802 82
Totals .....	6,767 33	773 30	2,221 89	9,762 52

Average cost per month :—

Wages .....	\$563 94
Fuel .....	64 44
Stores and provisions .....	185 16
Total .....	873 54

Average cost per working day—312 per year,—

Wages .....	\$21 69
Fuel .....	2 48
Stores and provisions .....	7 02
Total .....	31 29

Summary of Annual Expenses of the different Dredges.

Dredge <i>King Edward</i> .....	\$25,533 63
“ <i>Mud Lark</i> .....	14,530 71
Snag boat <i>Samson</i> .....	9,762 52
Dredge <i>Nakusp</i> , in narrows between Arrow lakes, Colum- bia river, assuming cost same as <i>Mud Lark</i> , or \$1,210.89 per month for 8 months per year .....	9,689 12
Total .....	\$59,513 98



## SESSIONAL PAPER No. 19

## DRY DOCKS.

The Dominion government owns and operates three dry docks, viz., the Lorne dry dock at Lévis, in the province of Quebec; the Kingston dry dock at Kingston, in the province of Ontario; and the Esquimalt dry dock at Esquimalt, near the city of Victoria, in British Columbia.

## LÉVIS DRY DOCK.

During the fiscal year 1902-03 the electric arc lamp posts around the dock have all been renewed with movable iron posts, provided with long arms and pulleys to allow the lamps of being lowered to the bottom of the dock. The government road leading to the dock and ferry wharf has been provided with incandescent lamps, as well as all the buildings used in connection with the dock. The current is furnished under contract with the Canadian Electric Light Company, which derive their power from the Chaudière Falls.

The dock has been maintained in an efficient manner with the ordinary minor repairs. During the fiscal year the dock accommodated nine vessels of a total tonnage of 27,233 gross tons and was occupied during 303 days.

The expenditure for the fiscal year was:—

Staff, maintenance and repairs . . . . .	\$13,847 26
Electric light installation . . . . .	3,254 75
	<hr/>
	\$17,102 01

## ESQUIMALT DRY DOCK.

During the fiscal year the dock was occupied 211 days by 25 vessels, aggregating 59,491 tons, and the dues collected for the above services amounted to \$13,668.91.

The only new work done at this establishment during the year was a complete covering over the caisson chamber made of 12 by 12-inch joists placed 4 feet apart, resting on concrete beds made around the coping of the chamber, and the whole covered in with 3-inch planking, and new cast iron beds fitted under No. 1 boiler.

The dock has been maintained in excellent working condition by the ordinary repairs to the pumping machinery, the steam boilers and the caisson; the outside dock works have been painted, the caisson chamber and pump wells were cleaned, and all the machinery generally overhauled.

The expenditure during the fiscal year 1902-03 was:—

Staff . . . . .	\$10,237 42
Maintenance and repairs . . . . .	3,021 10
	<hr/>
	\$13,258 52

## KINGSTON DRY DOCK.

During the fiscal year 1902-03 the dock was occupied 123 days by 48 vessels aggregating 26,907 gross tons.

The dock has been kept in excellent working condition with the ordinary care to the pumping machinery and minor repairs.

The expenditure for the fiscal year was:—

Staff . . . . .	\$2,995 00
Maintenance and repairs . . . . .	1,995 27
	<hr/>
	\$4,990 27

## RIVER DU LIEVRE LOCK.

This lock is situated at Poupore, on the River du Lievre, 12 miles above Buckingham, in the county of Labelle. It was built to overcome the difficulties of navigating



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the little rapid at that place, thus rendering the river navigable at all times of the season for a distance of 19½ miles to the Long rapid. The lock was completed in 1892 at total cost of \$233,658.65.

During the last fiscal year the lock was kept in good working order with the ordinary maintenance and small repairs.

In the month of September, 1902, a new cast iron valve was put in the upper gate to replace the one broken since the previous spring. In June last, two valves broken during the winter were also renewed.

The total cost of this work during the fiscal year 1902-03 was:—

Maintenance . . . . .	\$ 945 11
Repairs . . . . .	520 70
	<hr/>
	\$1,465 81

YAMASKA LOCK AND DAM.

This river takes its rise in the township of Bolton, in the county of Brome. It forms an outlet for several large lakes, and has a course of about 90 miles. It flows through the counties of Bome, Missisquoi, Rouville, Bagot and St Hyacinthe, Richelieu and Yamaska, and empties into the head of Lake St. Peter on its southern side, 8 miles below Sorel.

A contract for the construction of a lift dock and dam at Ile à Cardin, one mile and three-quarters below the village of St. Michel de Yamaska, and about four and a half miles from the mouth of the river, was entered into in 1881. This work was completed in 1886. It gives a rise of 5¾ feet.

By the construction of these works, the river has been rendered navigable for vessels of moderate draught up to St. Aimé, a distance of 20 miles.

Materials were purchased to repair the approaches of the dam.

Stone ballast was put in the dam where necessary.

The total amount expended during the year is \$2,900.50, as follows:—

Repairs . . . . .	\$2,276 54
Staff and maintenance . . . . .	623 96
	<hr/>
	\$2,900 50

ST. ANDREW'S RAPID, LOCK AND DAM.

*Red River, Man.*

The progress made by the contractors for this work has been very unsatisfactory, and very little has been accomplished.

The work done has consisted of the excavation of 32,000 cubic yards of earth from the lock-pit and upper canal entrance, and the excavation of 3,075 cubic yards of rock from the lock-pit.

The earth excavation was moved mostly by steam shovel during the summer of 1902. Rock excavation was commenced in February, 1903, and carried on until June 30, 1903, with the exception of the period from April 10 to June 15, caused by the flooding of the lock-pit on the former date by the spring freshets.

During the winter of 1902-3 4,900 cubic yards of sand for concrete, and 200,000 feet B.M. of square timber for cribwork, were delivered on the site of the work.

Soundings over the site of the dam and lower entrance have been taken during the winter, and a complete set of borings, for rock surface at close intervals, by the water jet method, are at present being made.

The expenditure for the fiscal year 1902-3 was \$62,852.84.



## SESSIONAL PAPER No. 19

## SLIDES AND BOOMS.

The Dominion Government owns and operates slides and boom works, built to facilitate the passage of square timber, round logs, flatted and dimension timber, &c., on the River Ottawa and tributaries, on the lower 40 miles or so of the St. Maurice, and in the Trent and Newcastle district, between Fenelon Falls and Heeley's Falls.

In the subjoined reports, the superintending engineers of these river works, Messrs. G. P. Brophy, F. X. Thos. Berlinguet and S. Clegg, give particulars relative to the construction, improvements and repairs carried out under their supervision on government slides, booms, piers, dams, streams, buildings, &c., during the fiscal year, the expenditure incurred for staff, maintenance, improvements, &c., the quantities of the various descriptions of timber that pass through their works, and other information of general interest and utility to lumbermen and the public at large.

## REPORT ON THE OTTAWA RIVER WORKS.

(By G. P. Brophy, superintending engineer.)

OTTAWA, September 26, 1903.

E. D. LAFLEUR, Esq.,  
Acting Chief Engineer,  
Public Works of Canada.

SIR,—Pursuant to instructions received by me in your communication of June 29 last, I have the honour to submit the following report on the works under my charge on the Ottawa and tributary rivers, for the fiscal year ended June 30, 1903.

After the passage of timber and logs in the season of 1902, the customary examination of the foundations of the river works was made at the time of low water, and the necessary repairs commenced and continued during the winter months, preparatory to the opening of navigation in the spring of 1903.

These works may be described as follows:—

## REPAIRS TO STATIONS ON THE OTTAWA RIVER (MAIN STREAM).

*North Chaudière or Hull.*—At this station the sides and bottom of upper slide, where worn, were patched with plank and timbers; loose planks were secured by spikes and missings one were replaced. New planking was placed on tops of guide booms at the head of the slide, and some of the timbers in boom were renewed. The booms were generally strengthened by new cross-fenders or cap pieces and screw bolts. At the lower slide a large jam of logs and timber was removed at the front of the waste gate. This has become lodged against the stoplogs, and prevented them from being raised or lowered to regulate the flow of water in the slide.

*South Chaudière or Ottawa.*—In the latter part of the summer of 1902 some repairs of a temporary character had to be made to the lower slides in order to pass the timber which arrived at this station then. At the foot of the third slide a portion of the flooring was removed and some of the cross sills, which were broken, were spliced. At the head of the fourth slide a small dam was built to back the water into the slide, while a quantity of loose stone was removed from the basin between the third and fourth slides. After the timber for the season had cleared this station, a start was made at the ordinary work of repair. The basin between the second and third slides was filled in, thus forming one continuous descent from the basin at the head of Amelia Island to the foot of the third slide. The old entrance to the third slide was lowered two feet, a pier 96 feet long, 12 feet wide, with an average height of 5 feet was built in the bottom of the basin. This pier supported the cross sills of the slide at centre, while the ends were supported by timbers 6 by 10 inches, spiced longitudinally to the side piers. The bottom of the third slide was overhauled throughout its length,



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150 feet. Broken sills were renewed, the foundations were blocked to proper grade where sagged, and the flooring renewed. The pier forming the north side of the third slide was rebuilt. It is 160 feet long, 9 feet wide and 6 feet high. The glance under Chaudière bridge was raised by placing two additional timbers  $10\frac{1}{2}$  by 12 inches by 20 feet between upright steel posts of the bridge. The guide boom at the head of the second slide was overhauled, new timbers, top planking, fenders, guy braces and rock bolts were furnished and placed in proper position. The top of the apron at the entrance bulk-head was covered with 3-inch birch plank, 12 inches wide and 16 feet long. At the entrance to the slide two boom piers were rebuilt from low water mark. Each pier is 13 feet long, 10 feet wide and 7 feet high. They are planked with 3-inch material in front and at both ends. New stop logs were provided for the different bulk-heads, and the hoisting gear and frames were repaired. The general storehouses, sheds, &c., were kept in an efficient state of repair during the year.

*Chats.*—The only expenditure for repairs at this station was for a supply of timber and spikes for renewal of damaged portions of glance in the pier in the canal leading to the slide. The labour was performed by the slide master and his assistants during the summer months.

*Cheneaux.*—At this place two capstans were provided to operate the gaps in the booms. They are constructed of wood, with iron spindles and mountings; are 4 feet in length by 2 feet in diameter, and are supplied with the necessary levers to work them.

*Calumet.*—The six-stick guide boom at the foot of Long Slide was taken apart and rebuilt. Three lengths, each 219 feet, were replaced with new timbers. The old screw bolts were repaired and used again. At the entrance to the Long Slide several of the cross-sills were broken. The floor was removed, new sills inserted in place of those damaged, and the planking relaid. The planking in the bottoms of the different slides was repaired where defective. A supply of timber suitable for repairs to the booms and piers was purchased and held in readiness in cases of emergency.

*Des Joachims.*—At weak places in the guide boom on the north side, at the entrance to the slide, extra timbers were set forming splices to stiffen the structure. The members of the boom were bound together by screw bolts, clamps and cross-fenders, while the top was covered with 3-inch plank. Two old piers were repaired, one above the entrance bulkhead and the other in the basin at the head of the slide. Upright timbers, held in position by cross-sticks, were placed in front of the piers, and to these were spiked timbers to form the face. The boom at the entrance bulkhead was repaired, five new timbers having been added, while the chains, clevises, &c., were adjusted and renewed where defects had occurred.

*Rocher Capitaine.*—In the rapids at Rocher Capitaine several obstructions, including 'Sickle Rock,' were removed. These proved a serious inconvenience to raftsmen, for they were not only a danger to passing timber, but also caused jams of logs to form on them, and thus necessitated the rivermen to steer wide of their proper course to avoid the blockade, and consequently the cribs were sometimes carried out into more dangerous portions of the rapids. Since this work has been completed the raftsmen are enabled to pass their timber with comparatively little danger, as they can now hug the shore, enter the rapids at the proper place, and avoid being carried out into the main chute.

#### TRIBUTARIES OF THE OTTAWA.

*Gatineau River.*—The chains, joint links and clevises of the main boom were repaired throughout the season of navigation. New timbers were placed where the old ones were unsuitable, and loose sections were bound by additional screw bolts and clamp irons. Some of the old piers were strengthened by encircling them with chains, which, being tightened, bound the bodies together.

A large pier near the mouth of the new channel was rebuilt from low water line. It is 38 feet long by 30 feet wide at top, the height being 12 feet. The front is covered



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with 3-inch sheathing, and has a batter of 1 in 1. The corners are supplied with fender pieces, and in the central portion a heavy chain was secured, to which the booms are snubbed. At the upper end of the Government Reserve, on the south side of the river, portions of the bank, forming the roadway along the reserve, had become washed out by the surface water running off adjacent property. To prevent further damage to the shore, a crib 60 feet in length, 12 feet in width, and 9 feet in height, was built and stone-filled. The top forms part of the roadway, and a culvert was made to carry the surplus water through the pier into the river. The bridge over the new canal, 52 feet span, was covered with 3-inch hemlock plank 15 feet long, and the approaches for a distance of 50 feet on each side (making a total of 100 lineal feet), were covered with the same class of material. The bottom stringers of this bridge were stiffened by bolting planks to the sides of the timbers. The top members of the truss were renewed, two pieces 10 inches by 13 inches by 24 feet being used for this purpose. The floor of the bridge over the old canal was covered, for a distance of 40 feet, with 3-inch hemlock plank, 15 feet in length.

*Madawaska River.*—At the mouth of the river the chains and fastenings of the retaining boom were examined and repaired. The upper portion of a boom pier was rebuilt. This is 18 feet by 20 feet at water line, 15 feet by 18 feet at top, 7 feet high, and is supplied with the usual fenders and mooring chains. At *Arnprior Slide* the guide booms were spliced with new timbers. The tops were sheathed with pine plank, and oak bond pieces were placed at regular intervals to hold the timbers together. Two fingers of apron below the dam were renewed and the sides of the crab frame on the bulkhead having become unserviceable were replaced. At *Flat Rapids* the long dam on the south side of the river was braced by posts set in rear, and a portion of the planking on the face was repaired where damaged. At the sorting boom at *Upper end of Calabogie lake*, three of the piers were repaired. The top timbers had become so much decayed that they had to be replaced by new ones. Fenders were placed at the corners of the piers to bind them until repairs of a more permanent character are undertaken. At *High Falls Station*, to prevent the wing pier between the slide bulkhead and shore from spreading, vertical pieces of timber were set at the front and rear, held together by screw rods  $1\frac{1}{2}$  inch in diameter. A pier 24 feet square at the water surface and 16 feet by 24 feet at top and 7 feet high, was rebuilt at the head of the slide. The slide house was kept in a state of repair, and during the summer months a quantity of plank was laid in the slide as required. At *Duck Rapids* the sheathing of the dam on the north side was patched, and along the crest 4-inch maple plank was laid to protect the ends of the covering. At *Chain Rapids*, bolts and spikes were provided for the angle guards on stop-log checks, while the hoisting crabs were adjusted.

Many of the repairs on the Madawaska were executed by the slide masters at the different stations, with the staff of men employed to operate the works during the summer season.

*Coulange River.*—At *High Falls* on this stream the foundations of the slide at the gully opposite the old blacksmith shop, for a distance of 150 feet, were repaired. New stringers, cross-ties and upright posts were put in and the structure was secured to solid rock by chains, eye-rods and bolts. At *Big Rock* the foundation cribwork having settled, 27 new posts, ranging (in length) from 6 feet to 24 feet, were set after the superstructure had been jacked to proper position. Loose rocks which had fallen from the mountain, and sawlogs were removed from the rear of the foundation cribwork, to prevent undue pressure at this place. About 15,000 feet B.M. 3-inch oak and maple plank were laid in the sides and bottom of the slide, and 114 posts, 32 cross sills and 150 braces were replaced. The top of the bulkhead was planked and a number of missing footboards were laid. Near the entrance to the slide, a snubbing pier 10 feet by 12 feet by 8 feet high, was rebuilt. The corners of the piers were patched with hardwood planks where worn by the booms and logs. The top of guide booms were planked where necessary and the chains and clevises renewed where found unserviceable. The brow of the hill along the slide was brushed to give the watchman at the signal station



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a better view of the slide. The fence along the government reserve was repaired by stringing new wire on posts.

*At Retaining Boom, above Coulonge village*, a pier 17 feet by 24 feet was patched. A quantity of the stone filling was removed and the front and back rebuilt. To hold the pier together, three vertical timbers were placed on either side and connected with screw bolts passing through the body of the pier.

*Black River*.—The sides and bottom of High Falls slide on this river were repaired by spiking the planks and timber where the old material was worn too thin. Thirty-three bars of iron  $\frac{1}{4}$  inch thick by 4, 5 and 6 inches wide, were laid on the sides and bottom to protect the wood surface from wearing too rapidly. All the works of repair were performed by the slide master and his men during the season of driving operations.

*Petewawa River*.—At *Second Chute Slide* some minor repairs were made to the posts, sills, braces and planking of the slide, the labour being performed by the ordinary staff during running season. At *Third Chute*, a portion of the main governing dam broke away in May, 1902, and as it could not be repaired to advantage at that season of the year the drives had to be passed over the chute—temporary guide booms, feeding gaps, &c., having been provided for this purpose. The different drives were put through expeditiously, without damage resulting to logs and timber, so it was decided to improve the channel by blasting rock obstruction, building certain side piers, and abandoning the slide. The work has been carried out, four pier dams having been built. Of the two upper ones, that on the south side is 82 feet long, 8 feet wide, and 13 feet high at outer end, decreasing in height at the shore end to 4 feet, and the one on the north side, 174 feet long, 8 feet wide, 7 feet high at the upper end, and 11 feet at lower end. These two are situated immediately above the C.P.R. bridge, and are for the purpose of guiding logs between the stone piers of the bridge. The other two piers are situated a short distance below this bridge; the dimensions of the one on the north side are 96 feet long in front, 75 feet in rear, 10 feet wide, with an average height of 11 feet, and of the other 82 feet long, 6 feet wide, and 4 feet high. These piers are sheeted on the face with 3-inch and 4-inch planks set vertically, and at places where the wear is greatest an extra covering of plank was laid horizontally.

A number of rocks were blasted in the rapids, and at the south end of the remaining section of the main dam a pier, 13 feet by 16 feet by 10 feet high, was built to snub the guide boom and feeding platform. During the past summer all the drives on the Petewawa were passed through the new channel, and the improvements were considered a complete success, as a large saving to the lumbermen, in time, was effected.

*At Crooked Chute* the main guide boom, at the head of the slide, was strengthened by placing a new single stick boom of 12 sticks, joined by  $\frac{3}{4}$ -inch chains, at the rear of the old boom, and secured to it by chains and cross-pieces. A rock bolt was set at the upper end to serve as a boom anchor, and two snubbing posts were placed in the two support piers. A section of boom 50 feet in length was sheeted with 5-inch plank to form a feeding platform at the head of the slide. The corner of the entrance pier was covered with iron bars  $\frac{1}{4}$  inch by 5 inches. At the outlet of the slide, iron bars  $\frac{1}{4}$  inch thick were placed on the sides of the cribwork to prevent wear, and throughout the length of the slide the sheeting, posts and braces were repaired where necessary.

*Dumoine River*.—At High Falls the long slide was patched in many places along the whole length of the structure. The sheeting in the bottom was renewed for a distance of 275 feet in length at a point near the slide outlet. At several places the upper portion of the slide had sagged and had to be raised to proper grade. Fifty-six bars of flat iron  $\frac{1}{4}$ -inch thick were laid in the bottom, and on the sides at the curves in the slide, to preserve the sheeting as much as possible from abrasion. Some 2,500 lineal feet of round timber were laid in the bottom of the slide, in the corners, to confine the water to the centre, and also to stiffen the superstructure. Sills, posts, braces and sheeting at various places were renewed and patched where most urgently needed.







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STATEMENT showing Expenditure for Repairs to Works on Ottawa River and Tributaries for fiscal year ended 30th June, 1903.

Name of Works.	Province.	Electoral District.	Expenditure from July 1, to Dec. 31 1902.	Expenditure from Jan. 1, to June 30, 1903.	Expenditure from July 1, 1902, to June 30, 1903.
			\$ cts.	\$ cts.	\$ cts.
<i>Ottawa River, Main Stream.</i>					
North Chaudière Station.	Quebec .....	District of Wright .....	97 48	714 15	811 63
South " "	Ontario .....	City of Ottawa .....	1,293 00	2,358 79	3,651 79
Chats " "	" .....	North Riding of Co. Lanark .....		65 60	65 60
Cheneaux " "	" .....	South Riding of Co. Renfrew .....		15 53	15 53
Calumet " "	Quebec .....	County of Pontiac .....		650 51	650 51
Joachim " "	" .....	" " .....		126 15	126 15
Rocher Capitaine " "	" .....	" " .....	394 90		394 90
			1,785 38	3,930 73	5,716 11
<i>Tributaries of Ottawa River.</i>					
Gatineau River...	" .....	District of Wright .....	1,159 36	1,225 64	2,385 00
Madawaska " .....	Ontario .....	South Riding Co. of Renfrew .....	183 63	1,200 84	1,384 47
Coulonge " .....	Quebec .....	County of Pontiac .....	704 26	1,475 13	2,179 39
Black " .....	" .....	" " .....	29 45	106 45	135 90
Petewawa " .....	Ontario .....	N. Riding Co. Renfrew and Nipissing .....	1,217 24	579 53	1,796 77
Dumoine " .....	Quebec .....	County of Pontiac .....		1,005 79	1,005 79
			3,293 94	5,593 38	8,887 32
<i>Roadway and Bridge ap- proaches between Ottawa and Hull.</i>					
Chaudière Bridge .....	Ontario .....	City of Ottawa .....	127 52	91 73	219 25
Union Bridge .....	Ontario and Que- bec .....	City of Ottawa and District of Wright .....	90 10	149 72	239 82
Hull Slide .....	Quebec .....	District of Wright .....	12 50	18 00	30 50
Roadway and Bridge ap- proaches between Otta- wa and Hull .....	Quebec .....	City of Ottawa and District of Wright .....	152 38	156 43	308 81
			382 50	415 88	798 38
Joachim Bridge approaches	Quebec .....	County of Pontiac .....			
			1,343 47		1,343 47
Laurier Bridge approaches.	Ontario .....	City of Ottawa .....			
				3,503 01	3,503 01
		Grand total .....			20,248 29

D. SCOTT,  
Accountant.

OTTAWA, September 26, 1903.



## REPORT ON THE ST. MAURICE RIVER WORKS.

(By F. X. Thos. Berlinguet, superintending engineer.)

THREE RIVERS, November 21, 1903.

EUGÈNE D. LAFLEUR, Esq.,  
Acting Chief Engineer,  
Public Works of Canada, Ottawa.

SIR,—I have the honour to submit the following report on the works under my charge on the St. Maurice river, and certain of its tributaries, for the fiscal year ended June 30, 1903.

At the low water season of 1902, after the drives had passed, the foundations of the various river structures were examined and a commencement made of the necessary repairs and improvements. The work was continued during the close season of navigation and early spring months, in order that everything would be in readiness for the opening of navigation of 1903. These works may be described as follows:—

*Pointe à Trudel Booms.*—On the 40th mile of the St. Maurice river, 1,412 lineal feet of booms, also three mooring piers, were examined and put in good condition for the coming season.

*Pointe Madeleine Booms.*—On the 39th mile, 2,588 lineal feet of booms. Stone ballast was put in the piers where necessary. A number of boom chains were supplied.

*St. Jacques des Piles Booms.*—On the 38th mile from the outlet; 2,176 lineal feet of 5 to 6-ply booms, also 7 mooring piers were put in good condition. A number of boom chains were supplied. Stone ballast was put in the piers where necessary, and ordinary repairs were made to boats, scows, station house and fences.

*Petites Piles Booms.*—On the 35th mile on the St. Maurice; 3,297 lineal feet of 3-ply booms, 1,109 feet of 4-ply booms, and 202 feet of 5-ply booms were put in good condition. A number of boom chains were supplied. Stone ballast was put in the nine piers where necessary.

*Pointe à Paquin Booms.*—On the 33rd mile; 4,238 lineal feet of 5 and 8-ply booms were sheathed with 3-inch deal. Two jam piers measuring 50 by 40 by 38 feet, marked Nos. 10 and 11 on plan submitted.

*Rapide des Hêtres Booms.*—On the 26th mile; 600 lineal feet of 2 and 3-ply booms were put in good condition, and one anchor pier was raised few feet and stone-filled.

*Shawinigan Upper Bay Booms.*—4,200 lineal feet of five-ply booms were sheathed and put in good condition. A number of boom chains were supplied. Three piers were raised and stone filled.

*Shawinigan Slide.*—A section of the bottom and sides of the slide were repaired by replacing the worn out timber and planking with new material, the apron faced with hardwood, and the projecting spikes in the bottom and sides of the slide were counter sunk.

*Ile aux Tourtes Booms.*—On the 17th mile, 11,805 lineal feet of one to seven-ply booms were put in good condition, and were left stretched for the winter to close the eastern channel above the island and the western channel below the said island. One jam pier was raised and stone-filled.

*Cap aux Corneilles, Eastern Booms.*—On the 3rd mile, 1,246 lineal feet of 8-ply booms, 2,114 feet of six-ply booms, 294 feet of five-ply booms, 1,933 feet of four-ply booms, and 1,005 feet of two-ply booms were put in good condition, also 25 piers were patched at corners and on faces, where damaged. Posts were renewed where worn out and decayed.



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*Cap aux Corneilles, Western Booms, Three Rivers Sluice Gates.*—On the 2nd mile, 108 lineal feet of seven-ply booms, 777 feet of six-ply booms, and 402 feet of four-ply booms, also seven mooring piers were examined and put in good condition.

*Vermilion River.*—This river flows from the north-west and discharges into the St.Maurice at a point 121½ miles above its mouth. The dam at the head of the Iroquois Falls was rebuilt in 24 feet of water, also 400 feet of 3-ply booms were renewed.

The drives of 1902 were fairly successful in reaching their destination, and last spring a very favourable pitch of water prevailed for the early movement of timber; but shortly after the freshets had run off the river drivers had to contend with low water conditions, so much so that many of the logs taken from remote berths on some of the tributaries did not get out. The following statement, compiled from information furnished by the Collector of Revenue in your department, shows the quantity of the various descriptions of timber that passed these works, and the revenue accrued thereon, during the season 1902:—

	Pieces.
Saw-logs . . . . .	1,002 187
Small logs . . . . .	1,954,707
Flat and round timber . . . . .	6,350
Cedar . . . . .	418
Square timber . . . . .	176
Total . . . . .	2,963,838

And 140 cords pulp wood.  
Revenue accrued and collected, \$29,232.33.

I have the honour to be, sir,  
Your obedient servant,  
F. X. T. BERLINGUET,  
*Superintending Engineer, St. Maurice River Works.*

REPORT ON THE TRENT AND NEWCASTLE DISTRICT WORKS.

PETERBOROUGH, September 29, 1903.

EUGÈNE D. LAFLEUR, Esq.,  
Acting Chief Engineer,  
Dept. of Public Works, Ottawa.

SIR,—In compliance with your request in your letter of June 29, 1903, I have the honour to submit the following report on the works under my charge on the Trent river and the waters tributary to it for the year ending June 30, 1903.

These works extend from the Bay of Quinté, on the south, to Balsam lake on the north.

*Healey's Falls.*—The glance pier was rebuilt from water line and the booms were repaired. A new platform was put on the dam with cedar plank covering. A new track was placed for moving the stoplog winches.

*Hastings.*—The booms and the slide were repaired.

*Little Lake Peterboro'.*—The booms here are about ¼ a mile long, with four anchor piers. The boom was taken off in the fall and replaced in the spring, overhauled and put in good order.



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*Katchawannoe Lake.*—The boom dividing this lake, making a log and boat channel, from Young's Point to Lakefield, a distance of  $4\frac{1}{2}$  miles, was overhauled and put in good repair.

*Burleigh Falls.*—The work of blasting out the rock and improving the log channel here was completed as far as possible. The log channel was greatly improved, and no trouble was experienced with the logs at that point during the season.

*Lovesick Lake.*—The boom here is about  $\frac{1}{2}$  a mile long; it was overhauled and put in position.

*Deer Bay.*—The boom at this place was put in position and some minor repairs done.

*Buckhorn.*—The side pier at the foot of the timber slide was undermined by the water and logs. This was repaired by putting vertical sheeting on the inside of the pier and refilling with stone. The nose of the piers on the slide were rebuilt and new sheeting put on.

*Fenelon Falls.*—The booms here were overhauled and put in good order. Some minor repairs were made to the slide.

*Scugog River, Lindsay.*—The work of dredging in the Scugog river, Lindsay, was completed. The work has greatly improved the channel for both logs and boats.

I have the honour to be, sir,

Your obedient servant,

S. CLEGG,

*Superintendent.*



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## BRIDGES AND ROADS.

It may be stated that, in the older provinces of the Dominion, the federal government has confined itself as a rule to take under its exclusive control and make provision towards the construction and maintenance of important interprovincial road bridges and bridges required across waterways.

In the sparsely settled districts of the North-west Territories, the government of Canada has undertaken to provide for the erection and maintenance of ordinary road bridges over large streams; bridges that are urgently needed to afford uninterrupted communication through trails and highways of national importance, which neither the municipalities to be more immediately benefited by the structures, nor the territorial authorities most directly concerned, could be expected to erect and maintain at their sole expense.

During the last fiscal year works have been executed on the following bridges:—

## OTTAWA BRIDGES.

## BRIDGES AND APPROACHES BETWEEN OTTAWA AND HULL.

*South Channel Slide and Hydraulic Channel Bridge.*—The roadway of this bridge was scraped frequently during the year, the gratings and water pipes were cleaned when found necessary. At the approach on Middle street, a sidewalk was built on the north side. It is supported by iron beams and brackets and fitted with guard fence of the same design as that on other parts of the bridge. The length of the sidewalk is 45 feet and width 5 feet. The surface is finished in granolithic laid on concrete supported by arched plates in bottom.

*Union Bridge.*—A new covering of 3-inch pine planks was laid on the westerly portion of the roadway between the street railway company's tracks and the sidewalk, this portion being 12 feet in width and 230 feet in length. The sidewalks were patched, the iron gratings at the south end were repaired where broken and their frames properly levelled, and the roadbed was cleaned at different times when necessary.

*Hull Slide Bridge.*—The roadway of this bridge was cleaned and the gratings were kept free from debris.

*The Causeway leading to Hull* was cleaned as required and the rubbish carted off. The different gratings and 'Weeper' holes were examined and cleaned, and the wheel guards, sidewalks and guard rails were kept in a state of repair throughout the year. During the winter months surplus quantities of ice and snow were removed from the sidewalks and the roadbeds of the different bridges and causeway, for the convenience of those having occasion to use these thoroughfares.

*Laurier Bridge.*—At the westerly approach of this bridge, after the surface at subgrade was formed and thoroughly tamped and rolled, Nepean sandstone paving blocks were laid on a bed of sand for a distance of about 600 feet in length, and an average width of about 38 feet, and the joints on top well grouted with cement mortar. At the easterly approach of the bridge, concrete sidewalks were laid on both sides from the end of the bridge to Nicholas street, an average distance of about 265 feet.

## ONTARIO AND QUEBEC.

*Des Joachims Bridge.*—In spring of 1902 when frost came out of the ground, owing to unequal settlement of material in the fill, a section of retaining walls, on both sides, for a distance of some 100 feet, bulged and finally collapsed. This approach had been built during winter, and it was impossible to prevent a certain amount of ice and snow from entering the work. Last October, when the water in the Ottawa was



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at a low pitch, the repairs were completed in the following month. The damaged walls were removed and rebuilt, care being taken to have a sure foundation and increased batter to guard against failure of the work in the future.

At several places along the roadway filling was done on the surface to procure a better graded thoroughfare.

*Portage du Fort* is on the north shore of the Ottawa river, in the county of Pontiac, 60 miles above the city of Ottawa.

At this place an island divides the River Ottawa into two channels, called the north and south channels, the village of Portage du Fort is on the north shore of the north channel. In the fall of 1901, with contributions from the provinces of Quebec and Ontario, the department completed a steel bridge across the south channel. The bridge over the north channel was then unsafe for traffic, and it being considered as forming part of the interprovincial bridge uniting the two provinces, the department decided to also renew this bridge with a steel structure.

In June, 1903, a contract was entered into with Mr. Thomas Moran, of Arnprior, for the construction of two abutments and approaches. The work had not been commenced at the end of the fiscal year.

## POND CREEK BRIDGE.

Pond creek is an outlet to Leamy's lake, and flows into the Ottawa river, half a mile above the mouth of the Gatineau river.

On November 24, 1894, a contract was entered into for the construction of a bridge 235 feet long over all, and 20 feet wide over a creek, for a bulk sum of \$2,490.

The bridge was completed and opened to traffic on May 1, 1895.

During the fiscal year 1902-03 the whole flooring and supports were renewed and some repairs made to the stone rip-rap abutments.

Expenditure during the fiscal year, \$1,130.52.

The total expenditure to June 30, 1903, is \$5,066.79.

## NORTH-WEST TERRITORIES.

*Battleford Bridge.*—The superstructure of this bridge was completed in the month of May, 1903, and opened to traffic. It is a very strong bridge of three spans, two of 86 feet in length, and the other of 156 feet. This superstructure has been placed on the piers of the old bridge which collapsed in 1900. As stated in previous reports, the substructure should live for four years more, when railway communications will give a much better opportunity of freighting the material necessary for replacing it. At present the bridge is in perfect condition, at a very high level, and well protected against freshets. It will require no alterations nor repairs, unless unforeseen accidents, for four more years, when it will be necessary to remove the old piers and build a concrete substructure.

The expenditure during the fiscal year was \$21,848.97.

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CEMENT LABORATORY,  
DEPARTMENT OF PUBLIC WORKS, October 29, 1903.

E. D. LAFLEUR, Esq.,  
Acting Chief Engineer,  
Department of Public Works.

SIR,—I have the honour to inclose herewith the annual report of this branch of the department for the year ended June 30, 1903.

I am, sir,

Your obedient servant,

GEORGE E. PERLEY,  
*Engineer in charge.*



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Since June 30, 1902, all samples submitted to this branch have been fully tested and reported upon, chiefly amongst them being, the cement supplied for the construction of the high level pier at Montreal east, the Montreal elevator, and also sand for work at St. Andrews, North Manitoba.

Twenty-six tests were made for the Marine and Fisheries department for work on the pier at Grand Traverse, and tests were made of cement for work at Father Point for the lighthouse.

Mr. S. M. McLay was appointed to this staff from the Marine department for instruction in the method of mixing and using mortar and concrete for the work at Grand Traverse, thus enabling him to take charge as inspector of the work.

Information was also given to the clerk of works of lighthouses on the upper lakes, with reference to quantities for concrete and means of depositing under water.

Information has also been given to the Departments of Railways and Canals and Militia.

In the tests of 'Star' brands of Portland cement for the Montreal elevator, the cement was rejected, it did not fill the requirements of the specification in the chemical analysis, it was found to be under-burned and over-clayed, a sample of the rejected cement was submitted to the chartered testers, Messrs. Booth, Garret and Blair, Lathbury and Spackman, of Philadelphia, S. B. Newburry, Sandusky, Ohio, School of Science, Toronto, and McGill College, Montreal, the returns from these chartered testers coincided with the results found in this laboratory.

A change was made in the chemical composition of the cement, and more thorough burning inaugurated, thus bringing the cement up to the requirements of the specification. This retarded the work for some time, but after the correction was made, an officer of the department was sent to the cement works to take samples and forward them to this laboratory for test purposes. It was found that something had to be done to facilitate the testing so that the contractors might not be delayed. It was decided to try what steam and hot water would do in furthering quick returns, briquettes were made, and after nine hours' exposure to the normal temperature of the laboratory they were placed in steam at 140° F. for three hours, at the end of which time, they were immersed in water at the same temperature for twelve hours, they were then tested and gave in the neat test a variation of about 146 pounds and in the three to one about 34 pounds, compared with the straight seven day test, this was so marked that it was thoroughly reliable. The facilities of the laboratory were so meagre that only a few samples could be treated as above at one time, not enough to keep the work supplied, plans were designed for a large accelerated steam box with a movable grating, allowing the briquettes to be placed in steam and at the end of the specified time the grating could be lowered into the water, thus immersing the briquettes.

This has proved so satisfactory that there were only three carloads held for the straight seven-day test out of sixty; the samples out of these carloads did not come up to the average in the accelerated tests, but were satisfactory in the seven-day tests.

It is well to state that a check was kept on the said tests by also making one for straight seven days of each sample submitted to the accelerated tests, and from the average difference of the two methods employed the variation before mentioned was found.

It has been decided to have crushing tests made of concrete blocks. A crushing machine has been ordered, and will be installed in the laboratory. The manufacture of concrete blocks has been started and will be carried on under various conditions, both in the laboratory and at the elevator at Montreal. The rooms now occupied by the Militia Department over the laboratory have been secured, as the Militia Department is to vacate them at the end of the present year. This will allow of the chemical section of the laboratory being installed in one and the general office in the other, retaining the rooms on the lower floor for the mechanical portion, thus allowing a foundation to be built for the crushing machine, and a stairway connecting with the rooms above.



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This arrangement will give better facilities for the chemical work, insuring against dust and dampness, which have militated against accurate work up to the present.

In July the staff of this branch was augmented by a second assistant, thus lightening the work to some extent, which has grown very much in the last few years, and the outlook for the use of cement is growing more rapidly. It is taking the place of timber and masonry, being more lasting than the first and cheaper than the last, and with better results.

In February a trip of inspection of the cement laboratories of the United States was proposed by the Department. This was carried out. The principal laboratories of New York, Philadelphia, Washington, Pittsburgh, Toledo, Detroit, Sandusky and Toronto were visited. It was found that the methods adopted by the American Society of Civil Engineers was modern, concise and thorough. On the return to Ottawa a change was made embracing the American Society's methods, gang moulds, moist closet and grips for testing machine were ordered. When everything is in order for the new mode, a number of the machines which have become obsolete can be removed, giving more room to place the crushing machine. For this a foundation will have to be started from the rock, as the machine has a capacity of 300 tons, requiring a substantial foundation.

A number of tests have been made for the Architect's branch, and general information has been given it; also to the engineers of the department with reference to the mixing, quantities and general information as to mortars and concrete. A number of contractors have been assisted in the same manner.

The Secretary of the Department has been supplied with information as to the number of manufactories in Canada and their yearly output. The same information has been given to the Belgian Consul by request.

## HYDROGRAPHIC SURVEY.

## ST. LAWRENCE SHIP CHANNEL.

From July 1, 1902, to the late fall, the topography of both shores has been completed to about a mile below Pointe Platon, and the soundings have been closed opposite the wharf at Lotbinière.

All the main triangulation points down to Pointe Platon have been marked on the ground with cast iron posts, and all these stations but 16 have been observed from.

The observations at these 16 stations could not be completed on account of the unfavourable weather that prevailed during last fall for alt-azimuth work.

Gaugings between Stone Island and Point Platon have also been registered until November.

At the department's request, Mr. Biggar, of the Department of the Interior, has made astronomical observations at Sorel and Three Rivers, and has furnished the exact geographical points of station LX. (Three Rivers and V. (Sorel).

Needless to say that this information is of great value, and will enable to calculate the latitude and longitude of all main triangulation stations, church spires, light-houses, &c.

During the winter all the members of the staff have been kept busy calculating the main triangulation points, reducing gaugings and soundings, and plotting the information obtained during the summer.



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This spring outdoor work was only begun on May 18, owing to the fact that the survey boat was not available.

From May 15 to June 30, 1903, the gauges were re-established at the different stations between Stone Island and Pointe Platon.

Between Three Rivers and Grondines few secondary points were observed, and all the stations between Grondines and Pointe Platin were re-flagged and observations begun.

On May 15, 1903, the houseboat *Lotbinière* and yacht *Marie* were also ordered down to Three Rivers to prepare for outdoor work.

From May 20 to June 29, 1903, the sounding party were kept busy laying sounding ranges at Lotbinière and preparing for work.

During this fiscal year the office staff has completed the plans (500 feet to 1 inch) down to Grondines. The charts of the river for publication purposes were completed down to the head of Lake St. Peter, and those from Pointe du Lac to Champlain were begun.

The preparation of the 'tableaux' showing the calculations of the main triangulation and secondary points, geodetic co-ordinates of same, &c., were begun and gauge profiles completed up to date.

The total expenditure for the fiscal year was \$29,829.62.

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*The following reports were received too late for insertion in their proper places:*

### QUEBEC.

#### BELŒIL (GUIDE PIERS).

Belœil is a post village in the county of Verchères, on the north side of the Richelieu river, 21 miles north-east of Montreal.

During the fiscal year 1902-03, the sum of \$500 was paid to Mr. Tancrède Bienvenue for damages to his property caused by the construction of guide piers and guard wall some years ago.

The amount was authorized to be paid by Order in Council No. 246230, in full settlement of Mr. Bienvenue's claim of \$2,000. The legal and other expenses in connection with the claim amounted to \$53, making a total of \$553.

#### CAP DE LA MADELEINE.

Cap de la Madeleine is situated in the county of Champlain, on the River St. Lawrence, 3 miles from Three Rivers.

During the fiscal year 1902-03, the sum of \$841.02 was expended in repairs to the wharf at this place, the sheathing of the ice-breaker on the up-stream side was partly renewed, and the sloping face of the wharf was repaired.

#### CÔTEAU LANDING.

Côteau Landing, the chef-lieu of the county of Soulanges, is situated on the north shore of the River St. Lawrence, at the foot of Lake St. Francis, 36 miles above Montreal, and 2 miles from Côteau station, on the Grand Trunk railway.

During August, 1902, the sum of \$213.48 was expended for materials purchased in



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connection with repairs carried out during May and June of the same year, to the public wharf at that place.

## CÔTE STE. CATHERINE.

Côte Ste. Catherine is a landing place situated on the south shore of the River St. Lawrence, in the county of Laprairie, about 5 miles west of the village of Laprairie.

The public wharf there consists of a head-block of close-faced crib-work, 82 feet long, 20 feet wide, laid parallel to the current, terminated at its upstream end by an ice-breaker; the approach from the shore to the block is also of close-faced crib-work, 115 feet long by 18 feet wide. The outer face of the block stands in 6 feet at low water level.

During June, 1903, the sum of \$493.59 was expended to procure materials to effectuate repairs to the approach of the wharf, which had been damaged by the ice during the spring.

## KAMOURASKA.

Kamouraska, in the county of the same name, is on the south shore of the St. Lawrence, 90 miles below Quebec.

During the fiscal year 1902-03, the sum of \$160.30 was paid in settlement of accounts connected with the work of the previous year, and rendered too late for payment.

## MURRAY BAY.

Murray Bay, or Malbaie, is on the north shore of the St. Lawrence, in the county of Charlevoix, 83 miles below Quebec. During the fiscal year 1902-03, trifling repairs were done to the wharf, amounting to \$224.86.

## RUISSEAU LE BLANC.

Ruisseau LeBlanc is a small village on the northern coast of Baie des Chaleurs, in the county of Bonaventure, the village is built near the mouth of the river, also called Ruisseau LeBlanc.

In order to protect the entrance of the river and afford shelter for the fishing boats, it was decided to build a breakwater wharf on the west side of the mouth of the river, and a contract was entered into on March 20, 1902, with Mr. John Burns, of Ottawa, for its construction.

The work was completed in November the same year, at a cost of \$21,077.29.

The breakwater is built at right angles to the general line of shore for a distance of 375 feet in a south-westerly direction, thence with a slight angle towards due south, a further distance of 125 feet, making the total length 500 feet, with a width of 20 feet on top, the work is substantially built of close-faced timber, and round cross and longitudinal ties, filled with stone ballast and sheathed on the west side, outer end and for a length of 12 feet on the east side, with 6-inch hardwood planks. The top is planked over with 5-inch spruce planks.

The outer end of the breakwater wharf stands in 7 feet at low water spring tides, which rise 8 feet. The top of the wharf is 7 feet 6 inches above high water spring tides.

## ST. ZOTIQUE.

St. Zotique is situated on the north shore of Lake St. Francis, in the county of Soulanges, Quebec.



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The landing pier at that place consists of a block 132 feet in length by 24 feet in width; the approach is composed of 34 piers placed at intervals of 20 feet, and varies from 8 to 12 feet in width.

During the month of August, 1902, the sum of \$203.12 was expended in slight repairs to the pier.

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In conclusion, I assure you that without the efficient and conscientious help rendered by my assistants it would have been impossible to handle the enormous business connected with the works under the control of this branch of the service, and I take this opportunity of thanking them for the valuable services they have rendered.

EUGENE D. LAFLEUR,

*Acting Chief Engineer.*



APPENDIX TO PART IV

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REPORT

ON THE

STEEL GRAIN ELEVATOR AND SHORE WHARF

IN

MONTREAL HARBOUR

BY

ARTHUR ST. LAURENT, C.E.







## WORK DONE IN 1902.

OTTAWA, January 8, 1903.

SIR,—I have the honour to present herewith my report for the year ending December 31, 1902, as engineer in charge of construction of the steel grain elevator and adjacent shore wharf, being built in section 15 of the Montreal harbour, by the Steel Storage and Elevator Construction Company of Buffalo, N.Y., for the Board of Harbour Commissioners of Montreal.

## ELEVATOR BUILDING.

On April 16, 1902, after the approval of plans by the Honourable the Minister of Public Works, a contract was passed between the Harbour Commissioners of Montreal and the Steel Storage and Elevator Construction Company of Buffalo, N.Y., for the construction of a fireproof grain elevator of 1,000,000 bushels storage capacity, to be completed by August 1, 1903; the contract being for an elevator building complete, together with marine tower and all the machinery and millwright work contained therein, necessary to place the entire structure in a complete and satisfactory operating condition, but not including the shipping conveyors nor galleries, which are to be provided for afterwards in connection with freight sheds on piers.

The contract does not include the dust burning apparatus, in connection with the dust collecting system and sweepers specified to be arranged on various floors of main building, the burning apparatus having been left to be determined later and to be located convenient to elevator building.

The track approaches and grading outside the building do not form part of the contract, and is left to be done by the Harbour Commission.

The price to be paid to the contractors for the work included in the contract, as above outlined, is \$606,600, and in clause 3 of the contract the following was inserted by the commissioners with reference to monthly payments and the appointment of an engineer in charge:—

‘On the tenth day of each calendar month, 95 per cent of the value of the work done on the site and cost of materials on the ground, up to the first day of said month, as certified by an expert in charge of the construction appointed by the Minister of Public Works, less any previous payments,’ &c.

This stipulation was approved by the Honourable the Minister of Public Works, who placed me in charge of this construction, in addition to my other duties in the department.

## GENERAL DESCRIPTION.

Before going into details as to the work done by the contractors since the beginning of operations, it is desirable to give a short description, showing the character of the building and the principal features of its equipment.

The elevator, which is located in the central portion of the harbour, on the shore wharf between the King Edward and Alexandra piers, will be fitted for receiving grain from cars and boats, and is intended to be provided with extensive conveyors for delivering grain to ships, at their berths, alongside the adjoining piers.

The structure will be entirely fireproof, with foundations and story under bins constructed of concrete with imbedded steel rods.



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Storage bins are constructed of steel plates and the cupola, above bins, of structural steel with concrete floors. The marine tower provided in front of the building is also of steel throughout, floored same as cupola.

Size of main building, on the ground, is 189 feet 3 inches long by 84 feet 3 inches wide, by 225 feet high from foundation level, or 194 feet 6 inches high from track floor to eaves of cupola.

Marine tower carrying the sliding marine leg, for unloading boats, is built so that it can be made movable on four tracks in front of the elevator. It is 33 feet long, 28 feet wide and 150 feet high, and carries weighing scale for grain.

Storage compartments are circular bins, 36 in number, 85 feet in height, and arranged in four rows of nine bins each, and rest on 45 concrete columns, in turn supported on concrete piers and piling. The interstices and outer spaces between bins are also utilized for storage.

Capacities and number of the different bins is as follows, assuming, as shown by experience, that the grain is compressed about 3 per cent of its original volume when the bins are fully loaded:—

	Bushels.
36 cylindrical bins, 20 feet 3 inches in diameter, 85 feet high—	
Capacity each, 21,183 bushels . . . . .	762,588.
20 interstice bins, 85 feet high—	
Capacity each, 7,708 bushels . . . . .	154,160
22 outside bins, 85 feet high—	
Capacity each, 3,280 bushels . . . . .	72,160
4 garnerers on top floor—	
Capacity each, 1,600 bushels . . . . .	6,400
4 scale hoppers on scale floor—	
Capacity each, 1,600 bushels . . . . .	6,400
Total capacity . . . . .	1,001,708

The grain business to be transacted in and through the elevator will be to unload boats or cars, and to ship grain either direct to cars or to boats, either by direct spouts or by means of shipping conveyors.

The elevator will contain four elevator legs, all of which will be equipped to receive grain from cars standing on two tracks, inside the building, or to be used as lofters legs in elevating grain from marine tower. All legs can also be used when shipping or transferring grain from any bin in house.

The arrangement of the floors below and above the bins is similar to that in the ordinary elevator.

In operation, the cars are hauled into the building in two sets of four cars each, and are unloaded with automatic shovels into four receiving hoppers under the tracks.

As the grain passes from the cars into the hoppers it is taken by endless belt carriers from the hoppers to the top of the elevator, where it falls into the garnerers, thence into the scale hoppers and to the scales, where it is weighed. Grain coming by boat is first weighed in scales installed in the marine tower, so that the shipper does not lose sight of his grain before it enters the elevator.

From the scales, in the building, the grain drops through spouts, from which it is taken by belt conveyors and handled longitudinally of the building and delivered into the proper bin.

If it is to be cleaned it falls through the bin to one of the cleaning legs, which elevates it, thence it passes over the sieves of the cleaning machines, returns again to the top of the house and down into a bin.

In providing power for the various processes, the plan is followed of utilizing individual electric motors, in order to obtain greater economy in power distribution.



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Provision is made for two shipping conveyors to be run from main elevator building in either direction, which will discharge on to the conveyors to be placed on piers.

Dust collectors and a sweeping system are also provided, and a pump is to be installed on the first floor in order to pump out water which may overflow during flood time into the boot tanks or hoppers.

The building is to be entirely lighted by electricity. It will also have an electric passenger elevator.

The handling capacities of the elevator are estimated to be as follows:—

Receiving grain from boats.. . . .	18,000 bushels per hour.	
Receiving from cars—4 cars per leg per hour, or 16 cars at 1,200 bushels per car . . . . .	19,200	“
Shipping to vessels by 4 lines of belt conveyors at 20,000 bushels per hour each.. . . .	80,000	“

With these capacities, and estimating that the house would be receiving only one-third of the time, during a season of 150 days, and using the shipping conveyors at an average of only three hours per day, the amount of grain handled through the house in one season would be from 15,000,000 to 18,000,000 bushels.

To the handling capacities mentioned above must be added: Shipping by direct spout to boats, if required, at the rate of about 36,000 bushels per hour, and shipping to cars at the rate of about 48 cars per hour.

## WORK OF CONSTRUCTION.

The work of construction on the elevator was practically commenced on May 8, 1902, when the first piles for the foundations were driven. Previous to that date some filling material had been deposited by the harbour plant on the site of the work, and the filling brought up to within a few feet of low water level.

Three floating pile drivers were employed in driving the piles from May 8 to July 16, when the last of the piles were driven. During that time the drivers worked 54 actual working days, driving an average of 57 piles per 24 hours, or in all 2,879 piles. Many delays occurred on account of frequent breakdowns in the machinery, but principally on account of the unexpected hardness of the material in which piles were driven in some places.

The first rows of piles on the harbour side had to be driven through the back pockets of the cribs, already sunk in place, to form the foundations of the shore wharf between Alexandra and King Edward piers, and the filling material in these pockets, as the pile driving progressed, became so compact that it was with great difficulty that piles were driven to the required depths.

In fact, in many pockets and immediately back of the cribwork, such obstructions were encountered that the piling was very unsatisfactory.

In a special report I advised the reinforcement of this portion of the foundations, by driving an extra row of piles and by connecting the two front concrete footings into one footing, so as to make one solid mass of the whole foundation system in the front. This was approved.

Securing and driving of these extra piles of course delayed the work to some extent.

The material, some distance back of the line of cribs, was easier, and the pile driving there was more satisfactory, though at several places the piles had a tendency to shift or crowd together, the result being many more piles driven than shown on plans.

The original length of piles used was from 25 to 50 feet, and the length, left in the work, after cutting off at proper level, varied from 18 to 42 feet.



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Most of the piles were of white pine, and a few of spruce and red pine.

There were 2,444 piles shown on plan, but 2,879 were driven, out of which 17 were broken, 21 too small and 33 unsatisfactory.

The contractors drove a greater number of piles than called for by the plans, outside of the 83 extra piles ordered in extra row, and the 71 broken or unsatisfactory which were also, of course, ordered to be replaced when possible. By unsatisfactory is meant those piles which did not come to a solid bearing.

Adding these piles to the number shown on plans, it still leaves 281 piles over and above the required number, which were not ordered by me nor the inspector. This is due partly to the neglect of the contractors to rectify distances, the piles having a tendency to shift or crowd together. In many cases, however, obstructions were met with, which threw the piles entirely out of place, and made the driving very irregular, thus making it very hard to follow the lay out shown on plans.

#### CONCRETE.

As soon as the piles were cut off under water level no time was lost in forming an embankment around the site; the water was pumped out, the filling material levelled up to about 6 inches below top of piles, and the whole site prepared for the concrete foundations.

The first concrete was deposited in the work on July 31 and from that date the work of concreting was pushed most actively until the beginning of December, when this work had to stop on account of cold weather.

The whole system of supporting piers and armed beams, arches, and the concrete and steel tank floor have been completed in a very satisfactory manner; over 7,000 cubic yards of concrete having been deposited in the work.

Of the concrete work, there remains to complete next spring (1903) a portion of the track floor, 2 boot tanks out of 4, the curtain walls between the piers, the tank hoppers and the various concrete and steel floors in the structure above the tanks, and the floors in the marine tower. This will take a little over 3,000 cubic yards of concrete to complete.

A considerable amount of false work and molds for concrete was required, and the tank floor with its system of armed concrete girders and beams was an intricate piece of work, which required much care and attention, so as to secure good results and ample strength throughout. I am glad to say that especially good work has been performed in this connection.

The proportions used in the concrete were generally 1 cement, 2 sand and 5 of unscreened crushed stone, and the ingredients were mixed in a Smith rotary mixer, which did excellent and rapid work. The concrete was dumped from the mixer into special carts, which were elevated when necessary, and wheeled to the depositing place.

#### CEMENT.

The 'Star' brand of Portland cement was the only cement used on the elevator building, some 9,000 barrels having been used for the work, already done, or an average of  $1\frac{1}{2}$  barrels per cubic yard.

This cement has proved to be very good, excepting one shipment of 500 barrels, which was rejected on account of not meeting the requirements, and showing signs of underburning. Otherwise the tests have been very satisfactory.

All cement has been tested in the laboratory of the department, and will continue to be tested there; no cement is used which does not meet the requirements.

The effect of these tests is not only to prevent the use of poor cement, but to induce the manufacturers to send only the best grade of cement, where it is known that the



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cement will be subjected to tests provided in the specifications and such other tests as the engineer may require.

In making these tests the practice recommended by the American Society of Civil Engineers has generally been followed, excepting that, after a few experiments, in order to save time and delay, the practice was introduced of accepting cement on accelerated tests made in a box especially constructed for this purpose.

The results of these tests are given at the end of this report in tabulated form. The accelerated tests were very reliable, and compare well with the seven days' tests. Whenever the accelerated tests failed the cement was detained for the straight seven days' tests, to insure against any possible mistake.

In addition to this, special tests have been made to determine the relative merits of the Chateauguay sand used on the work, and the Sorel yellow sand, compared with the standard crushed quartz.

In average tensile strength, briquettes made with the Chateauguay sand gave the highest results, being stronger even than the crushed quartz briquettes, and the Sorel sand the lowest, though these were still much above the requirements.

The concrete work will be resumed as soon as weather will permit in the spring.

## STEEL WORK.

At the end of the year all of the 36 circular tanks for storage of grain had been erected, and the placing of braces in the interstices bins, channel separators and stiffeners had been commenced.

This work is being done by the Warren City Boiler Works Co., of Warren, Ohio, as sub-contractors, and it has been well handled and well executed.

The punching of the plates for the bins was commenced in the company's shop, erected at the shore end of King Edward pier, on July 26, but it was not until September 23 that enough of the concrete tank floor was ready to permit the first rings of some of the tanks to be placed in position. From that time this work was carried on most vigorously, and on December 27 all of the 36 tanks were up to the required height.

The bottom rings in the tanks are made with plates  $\frac{1}{4}$ -inch in thickness, closely riveted together, the thickness of the plates being gradually reduced to  $\frac{3}{16}$  inch towards the top.

There remains a good deal of work to be done yet to complete this portion of the building, and the work will be continued during the severe months of the winter without interruption. The placing of the segmental plates from circular bin to circular bin all around the elevator will be a relatively long job, as will also be the placing of the channel separators between the bins.

It is expected, however, that enough of this work will be done at the end of February to permit the erection of the structural building, on top of the tanks, to be commenced.

The Dominion Bridge Company have the sub-contract for the erection of the cupola, the marine tower and the passenger elevator tower.

Most of the steel for the cupola is in their shops ready to be delivered at the elevator site as soon as circumstances will permit.

About half of the frame for the passenger elevator tower is also ready, and work is being done preparing the steel for the marine tower.

Tenders have also been called by the contractors for some of the machinery required for the elevator.

## INSPECTION AND RATE OF PROGRESS.

The whole of the work for the elevator and for the shore wharf has been closely inspected by competent inspectors in their respective lines, who have been acting



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under strict instructions from me, and who have neglected nothing to secure, in every case, good materials and good workmanship.

I have personally given the work close supervision, and I am sure the best results obtainable have been secured.

As to the rate of progress of the work, it may not be as advanced as anticipated, but in view of the unavoidable delays caused by the placing of extra piles in foundations as approved; by the rejection of the first shipment of cement, and in view also of frequent unfavourable weather, I consider that the contractors have done exceedingly well. I may also say that I have had no trouble in having the plans and specifications followed strictly, and that my instructions and decisions in this matter have been cheerfully carried out, whenever any difficulty arose as to their interpretation. The contractors certainly deserve praise for the excellent work done.

The value of the work done up to December 31 is as follows:—

Elevator building—

Work done.....	\$281,139 00
Materials on hand.....	23,120 64

Shore wharf—

Work done.....	65,911 74
Materials on hand.....	5,004 62

CONCLUSION.

In closing this report it is desired to express my appreciation and thanks for the trust placed in me by the department and harbour commissioners.

I desire also to express my appreciation of the courtesies shown me by the Secretary and Chief Engineer of the Harbour Commission, and to acknowledge the ability and efficiency shown by assistants and inspectors on the work.

SAMPLES of Cement tested for Montreal elevator, up to December 1st, 1902, in Departmental Laboratory, by Geo. E. Perley, Engineer in Charge of Testing Laboratory.

RATHBUNS “STAR” BRAND.

Fineness, residue on 2,500 mesh sieve. . . . .	132 per cent.
"          "      10,000      "      . . . . .	3.98      "
Blowing.....	Good.
Initial set. . . . .	25 minutes.

SAMPLES FROM 1 TO 138 SENT FROM MONTREAL.

STRAIGHT SEVEN DAYS.

Sample.	Neat.	3 to 1.
1 .....	530	150
2 .....	545	150
3 .....	525	176
4 .....	530	155
5 .....	533	153
6 .....	542	151
7 .....	545	165
8 .....	489	121
9 .....	520	157



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SAMPLES FROM 1 TO 138 SENT FROM MONTREAL--Continued.

STRAIGHT SEVEN DAYS				
Sample.	Neat.	3 to 1.	Second samples sent.	
			Neat.	3 to 1
10.....	599	151		
11.....	540	143		
12.....	404	60	456	107
13.....	458	60	535	107
14.....	477	94	574	163
15.....	531	141		
16.....	157	52		
17.....	361	70	165	100
18.....	505	102	472	101
19.....	490	82	419	104
20.....	106	59		
21.....	372	85		
22.....	439	90		
23.....	462	143		
24.....	529	158		
25.....	503			
26.....	447	110		
27.....	560	146		
28.....	540			
29.....	550	105		
30.....	120	105		
31.....	337	158		
32.....	374	75		
33.....	462	153		
34.....	27	59		
35.....	468	70		
36.....	445	69		
37.....	181	56		
38.....	415	82		
39.....	363	62		
40.....	361	92		
41.....	387	55		
42.....	51	75		
43.....	455	84		
44.....	492	90		
45.....	460	63		
46.....	460	83		
47.....	460	83		
48.....	488	78		
49.....	468	84		
50.....	469	112		
51.....	445	72		
52.....	241	77		
53.....	422	66		
54.....	520	117		
55.....	458	91		
56.....	448	75		
57.....	370	130		
58.....	412	63		
59.....	463	150		
60.....	452			
61.....	446	76		
62.....	586	95		
63 to 77.....	547	132		
78 to 83.....	530	158		
84 to 89.....	479	134		
90 to 104.....	506	125		
105 to 106.....	527	133		
107 to 119.....	529	127		
120 to 124.....	534	130		
125 to 138.....	535	125		



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Samples from 1 to 600 sent from Marlbank :—

Samples.	ACCELERATED.		7 DAYS.		28 DAYS.	
	Neat.	3 to 1.	Neat.	3 to 1.	Neat.	3 to 1.
1 to 9.....	460·5	160·33	489	81·33		
10 to 18.....	310	79	426	133·66		
19 to 27.....	427·33	112·66				
28 to 36.....	418	68				
37 to 45.....	489	105	553	176·66		
46 to 54.....	483	161·66	667·66	152·66		
55 to 63.....	336	131·66	421·66	110·66		
64 to 72.....		124				
73 to 81.....		135				
82 to 87.....	456·66	133·66				
88 to 96.....		155	661·66	166·33		
97 to 105.....	492	93·66	605	126·66		
106 to 114.....	443·5	111	525·66	158·66		
115 to 123.....	384	111·66	441	118·66		
124 to 132.....	305	69·5		145·66		
133 to 141.....	368	72·66	509	150		
142 to 150.....	463·33	118		172		
151 to 159.....		134·66	585·33	141·66		
160 to 168.....	515·33	113·33	592	163·33		
169 to 177.....		151	613·66	156		
178 to 186.....	442	118·33	536	154		
187 to 195.....	502·66	106·66	650·33	184·66		
196 to 204.....	488·33	123·66	590	154		
205 to 213.....	542	135·33	585·66	148·66		
214 to 222.....		160·66	665·66	207		
223 to 231.....	481	139·66				
232 to 240.....	455	130·66				
241 to 249.....	481·33	121	611	131·66		
250 to 258.....	523·33	127·5	597	154·66		
259 to 267.....	451·66	116·66	546·33	106		
268 to 276.....	473	116·33	617·33	112·66		
277 to 285.....	514·66	120·5	705·66	156		
286 to 294.....	584	130	698·33	109·33		
295 to 303.....	557·66	99·66	633·66	139·66		
304 to 312.....	447·66	117·33	565·33	117·33		
313 to 321.....	480	100	549	114·33		
322 to 330.....	566	113·66	599·66	130		
331 to 339.....	402	102·5	577·33	119		
340 to 348.....	517·33	102	582	168·33		
349 to 357.....	469	99	578	177·33		
358 to 366.....	495	92·5	538·33	130·66		
367 to 375.....	440·66	57	520·66	116·66		
376 to 384.....	414	35	552·33	119·33		
385 to 393.....	413	101	545	122·33		
394 to 402.....	481·33	99	566	117·33		
403 to 411.....	491	107	555	134·66		
412 to 420.....	495·5	118	574·33	139		
421 to 429.....	458·5	102	591·66	141·66		
430 to 438.....	454·66	96·33	627·66	116·66		
439 to 447.....	549	122·33	713·66	153·33		
448 to 456.....	509·33	113·33	693	196·66	632	305
457 to 465.....	651	148·33	694	172	598	202
466 to 474.....	490·33	160·66	702	180		
475 to 483.....	595	207·33	717·66	227		
484 to 492.....	337·5	100·33	643·66	136		
493 to 501.....	338·33	139·66	719	140·33		
502 to 510.....	405·5	109	720	133·66		
511 to 519.....	522·66	96	703·33	114		
520 to 528.....	271	120·66	671·66	173		
529 to 537.....	532·33	164·33	700·66	167		
538 to 546.....	376	135	647·66	140·66		
547 to 555.....	416·66	181	677·66	163	705	240
556 to 564.....	399·5	139·66	741	209	633	245
565 to 573.....		115·66	666	169	710	188
574 to 582.....	360·66	101	609	129		
583 to 591.....	406·33	109·33	692	133	859	173
to 600.....	599·66	114·33	725	139	693	195



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The following samples were sent from Montreal :—

Samples.	ACCELERATED.		7 DAYS.		28 DAYS.	
	Neat.	3 to 1.	Neat.	3 to 1.	Neat.	3 to 1.
1 to 5 .....	590·66	141	627	172		
6 to 9 .....	611·66	150	543	126		
1A to 5A .....	560·66	114·33	638·66	127·66		
1B to 10B .....	477	57	—498	108·33		

Tests marked thus — were held for seven days to insure the test.

‘ CANNON ’ BRAND.

A BELGIAN CEMENT.

Averages of 3 briquettes.

Specific Gravity.. . . . . 8,924

Blowing..No sign, but pat was very white.

Setting...Initial and full set of 3 neat and 3 to 1 pats.

No. 1...In steam and hot water at 140 degrees F. Initial set, 12 minutes. Full set, 1 hour and 5 minutes the pat looked to be over limed but showed no signs of cracking.

No. 2...In cold water at 60 degrees F. cracked and flaked off but had not set below the scales after 24 hours.

No. 3...In moist air at 65 degrees F. Initial set in 23 minutes, but was soft after 29 hours.  
3 to 1.

No. 1...In steam and hot water at 140 degrees F. Initial set, 48 minutes ; full set, 1 hour and 38 minutes, this pat showed an exudation of white limey substance at its base, the pat was only set externally.

No. 2...In cold water at 60 degrees F, never set; when it was being removed from the water after 24 hours it left the glass and became a mass in the dish, showing it to be a very slow setting cement and not fit to be used where it is deposited in water where it will have to bear any weight; the mass was in an unset condition after 96 hours.

No. 3...In moist air at 63 degrees F. Initial set, 3 hours and 44 minutes, after 24 hours had partially set but on slight pressure could be squeezed with the finger and thumb to a paste.

	Neat, 7 days.		3 to 1 Average.
Sample 1.. .. .	481.5	Sample 1.. .. .	151
" 2.. .. .	451.5	" 2.. .. .	143.33
" 3.. .. .	490.33	" 3.. .. .	146.66
" 4.. .. .	535	" 4.. .. .	144.33
" 5.. .. .	495.66	" 5.. .. .	203
" 6.. .. .	323.66	" 6.. .. .	146.33
" 7.. .. .	560.66	" 7.. .. .	211.66
" 8.. .. .	471.66	" 8.. .. .	181.33
" 9.. .. .	445	" 9.. .. .	131
" 10.. .. .	522.33	" 10.. .. .	229.33

Only a small quantity of this cement was used above water level.



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## WORK DONE IN 1903.

DEPARTMENT OF PUBLIC WORKS,  
OFFICE OF THE ENGINEER IN CHARGE,  
OTTAWA, January 25, 1904.

SIR,—I have the honour to present herewith my report for the year ending December 31, 1903, as engineer in charge of construction of the steel grain elevator and adjacent shore wharf now being built in section 15 of Montreal harbour, by the Steel Storage and Elevator Construction Company of Buffalo, N.Y., for the Board of Harbour Commissioners, of Montreal.

## ELEVATOR BUILDING.

## SUMMARY OF WORK DONE IN 1902.

Before going into details as to the work done during the past year, it is perhaps advisable to give a summary of the state of advancement of this undertaking at the close of the year 1902.

The contract for this work was signed on April 16, 1902, and the work of construction was practically commenced by the contractors on May 8 following, when the first piles for the foundations were driven.

Pile foundations were completed on July 16 of the same year, and in my annual report for 1902 will be found all details with reference to this portion of the work, a full record of the pile driving and difficulties met with being given, as well as a general description of the building, with details as to concrete work, &c.

The first concrete was deposited in the work on July 31, 1902, but this was discontinued about the beginning of the following December on account of cold weather; at that time the whole of the steel concrete foundations from pile heads to bin bottom, 46 feet in height, had been completed, with the exception of a portion of the track floor, two boot tanks and some of the curtain walls between the supporting piers. The total quantity of concrete deposited between July and December amounted to over 7,000 cubic yards.

As to steel work, at the end of 1902, the 36 circular tanks for storage of grain had been erected, and the placing of tie rods, channel separators and stiffeners was just commencing.

## CONSTRUCTION WORK IN 1903.

*Grain Bins.*—At the beginning of the year all of the circular tanks having been erected, work was continued without interruption during the winter months, building up and rivetting the small outside segmental bins, placing the channel separators between the bins, as well as the angle stiffeners and the tie rods in the interstices bins.

This was a long and tedious job, as it required shifting and straightening of tanks in order that the channels be in exact position for connection with the cupola columns. This work was completed in April.

In the meantime, caulking of the seams exposed to the weather had been commenced, and proceeded with until completed on May 11.

All the seams so caulked were covered with red lead.



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The painting of the outside surfaces of tanks began in May, after the rust had been scraped off with brushes and scrapers. Gray slate paint, furnished by P. Dodds & Co., was used, and two coats were applied. The painting of tanks was finished on May 25.

It is my opinion that during next summer season another coat of paint should be given to the tanks.

The double channel separators between the tanks were also filled with concrete.

The frames for the suspended bottoms in the two shipping bins were placed in position and finished with concrete reinforced by  $\frac{1}{2}$ -inch steel rods. These bottoms stand 32 feet above the tank floor.

*Concrete Cones in Bins.*—As the tanks are resting directly on the tank floor, it was necessary to build concrete cones inside, at a suitable slope, to run the grain out through the outlets left in the floor. These were formed with cinder concrete filling, covered with a 4-inch coating of 1:2:4 fine stone concrete, and finished smooth with enough mortar to prevent the stone from showing up. These cones required about 2,000 yards of concrete, and were finished August 26.

Care was taken to place a good layer of pure mortar before depositing the cinder concrete in all outside bins in order to prevent all possibility of rain water coming in.

## STRUCTURAL WORK.

The whole of the structural steel for the cupola, marine and stair towers, was supplied by the Dominion Bridge Company, who were awarded, by the contractors, the sub-contract for the erection of these structures.

Active erection work and riveting practically commenced on May 15, and was fully completed in October.

However, in August the work on the cupola was so far advanced as to permit the work on the concrete floors to proceed.

These floors were made with 1:2:5 cinder concrete 4 inches in thickness, reinforced by meshed wire and  $\frac{1}{2}$ -inch steel corrugated bars, and finished smooth with 1 to 2 mortar coating 1 inch thick.

The roofing was also made of cinder concrete 3 inches thick, reinforced by steel wire, and covered with a mixture of tar and asbestic cement, followed by 4 plies of tarred paper, then by another thick coating of asbestic cement and tar, with sand spread on top.

In December the concrete floors were tested with three times the live load per square foot as specified, with very satisfactory results, the deflection being very slight, varying between  $\frac{1}{16}$  and not quite  $\frac{1}{4}$  inch in the beam system, and between  $\frac{1}{64}$  and  $\frac{1}{16}$  of an inch in the concrete slab between supports.

Eight tests were made in all, those of the panels, which were thought to be the weakest or of having been made under unfavourable circumstances, having been chosen.

Sand bags were used for loading, the deflections being recorded at every additional ton load. The strength and rigidity of these floors was so well demonstrated that it was unnecessary to carry these tests further.

Since that time these floors have been subjected to the jars caused by the rolling or dragging of very heavy pieces of machinery in all parts of the house, and not the least sign of weakness has developed.

The wire used is No. 10 (a little less than  $\frac{1}{8}$  inch in size), 3 strands to the running foot, interwoven by smaller wire about every 8 or 10 inches. The  $\frac{1}{2}$ -inch corrugated bars mentioned above were used only around openings. The elastic limit of the wire was shown by actual test to be over 1,100 lbs.

After the erection of the cupola, marine and stair towers, the whole of the structural steel, which had received one coat of paint in the shop, was given a second coating over all accessible surfaces.



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The exterior walls of the elevator and towers were covered with No. 26 galvanized corrugated iron. This work of covering, which had been commenced early in August, was completed only in December, the delay being due to a general strike of sheet iron metal workers in the city.

Early in December all of the buildings were inclosed, windows and doors set into place, partitions for the switchboard and lavabo rooms made, and in fact the whole of the structural work completed, including painting, bush hammering of the concrete outside, &c., &c.

The car doors and the door closing the opening for the marine leg in the marine tower are of the Kinnear roller flexible steel pattern, and they can be worked very easily.

*Boot Tanks.*—Two of the boot tanks, for receiving the grain, were made during the fall of 1902, the two remaining tanks being made during the summer of 1903. They are constructed of 1:2:4 stone concrete with  $\frac{1}{2}$ -inch steel rods imbedded, the walls being 1 foot in thickness.

They were tested with water, and were first found leaking slightly at a few points. The leaks were pointed with cement mortar, and the whole of the outside surfaces coated with a mixture of alum and soft soap, dissolved in water, then with coal tar.

About December 21 the water rose around the tanks to a height of 12 feet above the bottom level, and has stood very high since, without the tanks showing any leakages.

This is being watched very closely, and final acceptance will only be given after the spring freshet, as there will then be ample opportunity of finding out if they are perfectly water-tight with the water level outside as close to the top as possible. In connection with these boot tanks, a pump having a capacity of 120 gallons per minute has been installed with all necessary piping, so that they may be quickly pumped out in case they are filled with water during very high flood seasons.

#### MACHINERY EQUIPMENT.

The work of installing the machinery equipment for the elevator and marine tower practically commenced only at the beginning of September.

*Elevator Legs.*—At the end of the year the main sheaves and pulleys, with their respective shafts and bearings, had been set in position at the head supports and on the garner floor for the four lofter legs.

On the ground floor, pulleys have been fixed to the concrete girders, for each one of the legs, and the putting up of the steel casing for elevating belts commenced.

About 95 per cent of the sheet iron casing for the lofter legs is ready to be placed in position.

*Track Hoppers.*—The framing for these, ready to be lined with sheet steel, has been made in three of the boot tanks.

*Scale Hoppers.*—Three of the scale hoppers have been completed and the fourth one nearly all rivetted. Part of scale frames and revolving castings under each scale hopper are also set into place. The capacity of these hoppers is for each over 2,000 bushels. In the marine tower the concrete platform for the scale has been made and the scale hopper erected, but not yet rivetted.

*Garners.*—The four garners in the elevator building have been completed and sliding doors put on. Their capacity each is over 3,000 bushels.

*Transfer Conveyors.*—The rollers for the two reversible conveyors on the conveyor floor, the driving pulleys, stretchers and trippers are placed ready to receive the belting.

*Marine Leg.*—At the close of the year the marine leg had been installed, with its system of working sheaves, pulleys, cable, &c., and the leg pusher placed in position.

Compressed air pipes for the working of the shovels were also attached to the leg.

The air compressor and reservoir, with connections to the shovel pipes, have also been put up.



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*Shovels.*—The cleaning and shipping shovels have been delivered in the marine tower, but, so far, only the bearings, shafts and pulleys are set in place. In the elevator building the driving shaft and pulleys of car shovels have been fastened to the piers.

*Cleaning Machinery.*—The two cleaners have been received.

*Car Puller.*—A special floor and special girders have been made on the ground floor with steel concrete, where the car puller is located. The car puller machinery is not yet installed.

*Motor Pedestals.*—Concrete pedestals have been made on the ground floor for the installation of motors. The base of these motors will stand at an elevation  $+125' 8''$ , or at about highest water level.

*Water Pipes and Drain Pipes.*—During the fall a water pipe was laid as far as the elevator by the harbour commissioners, but no connection with the building has yet been made.

The drain pipe from the lavabo room, under the ground floor of the elevator, and through the marine tower dock, has been laid.

*Gratings.*—All openings intended for the passage of grain through the first floor, including track hoppers, have been covered with their respective iron gratings.

*Man Holes.*—Man holes and covers for openings have been provided and set into place in first story to give access to elevator boots, and in the bin floor to give access to interior of bins.

*Spouting.*—At the end of the year all of the spouts from conveyor floor to bins had been set in place; also some of the car spouts.

Under the bins the castings with slides, &c., have been attached ready to receive the spouts of the ground story, which are now being made in the contractor's shop.

*Trippers.*—The trippers on the conveyor floor have been set on their track framing. The belt loaders have been received, and ready to be placed in position.

*Dust Collecting System.*—The piping for dust collecting in the marine tower has all been put up.

*Passenger Elevator.*—The guides for the elevator car, and for the counterweights, have been fixed ready to receive the passenger car.

*Tracks.*—Two railway tracks have been laid in the elevator.

## ELECTRICAL EQUIPMENT.

At the close of the year, work on the electrical equipment was just commencing. Eight conduct risers had been laid in north lofter leg insterstice up to spout story, and were being connected with transformer room.

*Filling.*—Filling around the elevator was done during the summer by the Harbour Commissioners and brought up generally to dock level. Some little filling yet remains to be done.

## SUMMARY.

Summarizing, at the end of 1903, the construction work on the elevator building, marine and stair towers was practically completed, about 75 per cent of the machinery equipment done, and the electrical work was just commencing.

All the machinery equipment, excepting the electrical motors, transformers, wires, dust fans and pipes, and a few pieces of machinery were delivered on the ground.

The force of men employed during the year varied from 45 up to over 100.

The cement used was mostly Rathbun's 'Star' and 'Condor' brands, and each shipment was tested in the departmental laboratory before acceptance.

A rigid inspection of all the work has been carried on, and I must say that good workmanship has been secured in every case; the contractors themselves being anxious to do first-class work.



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The estimated value of the work done to December 31, since the beginning of operations is as follows:—

Work done. . . . .	\$469,199
Manufactured materials on hand. . . . .	81,471
Total. . . . .	<u>\$550,670</u>

Outside of this there was \$3,554 paid for extra piles in foundations, as authorized.

There was used in the elevator 10,065 cubic yards of concrete, or nearly 20,000 tons. The quantity of steel used was 2,000 tons, and the weight of machinery to be installed will be 150 tons.

# SHORE WHARF.

In September, 1902, a contract was passed between the Harbour Commissioners and the Steel Storage and Elevator Construction Company, for the construction of the concrete superstructure of the shore wharf adjacent to the elevator, between the King Edward and Alexandra piers, the Commissioners deciding to have the work executed under the supervision of the engineer in charge of construction of the elevator, as an extra to the elevator contract, the work to be completed as early as possible during the season of 1903, and the contract price being \$95,460.

The foundation cribs for this superstructure had previously been sunk in place by the harbour commissioners, and did not form part of this contract.

The total length of the concrete superstructure is 576 feet, subdivided into three sections; the sections north and south of the elevator being a retaining wall of a standard type adopted by the harbour commissioners, with anchorage rods, &c., and the middle section 200 feet in length in front of the elevator being a hollow concrete dock, reinforced with steel bars and supporting the marine tower of the elevator.

At the close of the year 1902, the north section of the retaining wall was reported to be completed and of the south section three-quarters was done. For the central section, the foundation piles were reported all driven, about one-third of the hollow concrete dock finished and about half the concrete footing under water done with part of the cap pieces and steel shoes in place.

Concrete work on this dock was resumed after the spring high water of 1903, and fully completed in September of the same year.

The south retaining wall was also finished with all the anchor blocks and rods, bollards, &c., as shown on plans.

The concrete used was excellently mixed with a Smith revolving mixer, and deposited in the work with the utmost care so as to form a compact mass throughout and obtain outside faces without pits or irregularities. The proportion of ingredients used in the mixture was 1 cement, 2 sand and 5 stone for concrete above water, and 1, 2, 4 for concrete under water.

The cement used was Rathbun's 'Star' and 'Condor' brands, which gave excellent results in testing.

The walings under water were laid with care and bolted as shown on plans.

In order to enable me to give the required certificate for work done under water, it was necessary to employ a diver, who had no connection with the work, to make an inspection and report.

A rigid inspection was made and a few defects found in the concrete footings under water and in the walings, which were at once remedied by the contractors.

Full completion of the work was reported November 3, 1903.

During the construction of the retaining walls, the cribs supporting them and resting on the formation bottom settled to some extent, thus throwing the waling placed at low water line out of level.



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After the completion of the walls to the required elevation,  $+119'00$ , settling of the cribs continued to some extent while the required earth filling was being added at the back of the walls.

This settling varied from 3 to 8 inches for the north section, and from 2 to 6 inches for the south section, thus causing a few cracks to appear in the walls as already reported. These were repaired, and no doubt all settlement in connection with these cribs has now stopped.

Since the completion of the hollow dock in front of the elevator, after the laying of the necessary rails, the marine tower, which had been erected at the extreme north end, was rolled into position at the centre of the dock, and no deflection in the steel concrete deck forming the top of this dock was noticed.

The same careful inspection was carried on for this work as for the elevator.

In conclusion I must say that the contractors have shown good will, and have been anxious in every case to secure the best results under contract requirements.

I have the honour to be, sir,

Your obedient servant,

ARTHUR ST. LAURENT,

*Engineer in charge of construction.*

E. D. LAFLEUR, Esq.,

Acting Chief Engineer,

Department of Public Works, Ottawa.







PART V

REPORT ON GOVERNMENT TELEGRAPH LINES

FOR THE

FISCAL YEAR ENDED JUNE 30, 1903







## GOVERNMENT TELEGRAPH SERVICE,

DEPARTMENT OF PUBLIC WORKS,

OFFICE OF THE GENERAL SUPERINTENDENT,

OTTAWA, January 18, 1904.

F. GÉLINAS, Esq.,

Secretary, Department of Public Works

SIR,—I beg leave to submit herewith my report on the Government Telegraph Service for the twelve months ended June 30, 1903.

This report, as usual, is prefaced by a list to the present date of the land lines and cables in operation, with data of lengths, year of construction, number of offices at present established, and an estimate of the traffic handled in each instance.

The usual tabular statements, giving lists of the offices, operating staff, &c., in the several districts are appended to the report; likewise the tariff sheets, showing the rates charged for messages on the several lines.

I have the honour to be, sir,

Your obedient servant,

D. H. KEELEY,

*General Superintendent.*



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## GOVERNMENT TELEGRAPH SERVICE.

Location of Lines.	Points connected.	Year.	Length of Lines.			Number of Offices.	Yearly Average of Messages Sent.
			Land Lines.	Cables.	* Total.		
			Miles.	Kt's.			
Newfoundland.	Port au Basque—Cape Ray.....	1883	14	...	14	2	
Nova Scotia....	North Sydney—Meat Cove (with loops).	1880-1902	167½	....	168½	14	5,000
"	Across Bras d'Or Channel.....	1880	....	1½			
"	" St. Ann's Harbour.....	1887	..	1½			
"	" Ingonish Harbour.....	1887	....	1½	23	1	50
"	Meat Cove—St. Paul's Island.....	1890	....	20			
"	On St. Paul's Island.....	1890	3	....	109	8	2,500
"	Mabou—Meat Cove.....	1887-1900	109	....			
"	Barrington—Cape Sable.....	1883	16	....	17¾	Leas- ed.	
"	Across Bear Point Channel.....	1883	....	1½			
"	" Lt. House Channel.....	1883	....	1½	1¾		
"	Main à Dieu—Scatarie..	1902	....	1½	1¾	5	600
"	Mabou—Port Hawkesbury.....	1903	42½	....	73¾		
"	Port Hawkesbury—St. Peters...	1903	31½	....			
New Brunswick.	Chatham—Escuminac.....	1885	42	....	42	5	
	<i>Bay of Fundy System:</i>						
"	Eastport—Campobello.....	1880	....	1¾	44½	10	2,500
"	On mainland Eastport.....	1880	1	....			
"	On Campobello Island.....	1880	7½	....			
"	Campobello—Grand Manan.....	1880	....	7½	1		
"	On Grand Manan Island.....	1880	25½	....			
"	Grand Manan—Cheney's Island.....	1890	....	½			
"	On Cheney's Island.....	1890	¾	....	¾		
"	Cheney's Island—Whitehead Island..	1890	....	¾			
"	Partridge Island—Fort Dufferin.	1900	....	¾	¾		
Quebec.....	Bay St. Paul—Chicoutimi.....	1881	92	....	132	7	
"	Branch St-Alexis—Anse St. Jean.....	1898	40	....			
"	Anse St. Jean—St. Etienne.....	1903	21	....	82		
"	Chicoutimi—St. Charles.....	1903	37	....			
"	St. Anne—Lac Claire.....	1903	15	....			
"	St. Anne—St. Fulgence.....	1903	9	....			
	<i>North Shore Line:</i>						
"	Murray Bay—Chateau Bay.....	1881-1901	1,028½	....	1090	65	15,000
"	Across Saguenay River.....	1883	....	1½			
"	Bersimis to Manicouagan.....	1883	....	12			
"	Manicouagan to Godbout.....	1883	....	26	22½		
"	Chateau Bay—Belle Isle.....	1901	....	22½			
	<i>Branches:</i>						
"	Bay St. Paul—Petite Rivière.....	1903	12	....	26½		
"	Murray Bay—St. Agnes.....	1903	14½	....			
	<i>Quarantine System:</i>						
"	Quebec—L'Ange Gardien.....	1885	13	....	52¾	8	2,300
"	L'Ange Gardien—Orleans Island.....	1885	....	¾			
"	On Orleans Island.....	1885	29½	....			
"	Orleans Island—Isle Réaux.....	1889	....	2	2½		
"	On Isle Réaux.....	1889	2½	....			
"	Isle Réaux—Grosse Isle.....	1889	....	2	3½		
"	On Grosse Isle (all told).....	1885-94	3½	....			

\* For convenience in totalling, the knots of cable are regarded as statute miles.



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GOVERNMENT TELEGRAPH LINES—*Concluded.*

Location of Lines.	Points connected.	Year.	Length of Lines.			Number of Offices.	Yearly Average of Messages Sent.
			Land Lines.	Cables.	* Total.		
			Miles.	K'ts.			
Quebec.....	<i>Anticosti System :</i>						
".....	Gaspé--L'Anse à Fougère .....	1881	28	.....	316½	9	1,500
".....	L'Anse à Fougère--Anticosti... ..	1881	.....	44½			
".....	On Anticosti Island.....	1881-90	223½	.....			
".....	Anticosti--Long Point, Mingan.....	1890	.....	21			
".....	<i>Magdalen Island System :</i>						
".....	Meat Cove, C. B.--Magdalen Islands.	1880	.....	55	243	10	2,000
".....	On Magdalen Islands.....	1881-1902	83½	1½			
".....	Grosse Isle--Bryon Island.....	1902	.....	11			
".....	Bryon Island--Anticosti.....	1902	.....	93			
Ontario.....	<i>Pelec Island System :</i>						
".....	Leamington--Point Pelee.....	1889	12	.....	42½	9	800
".....	Leamington Dock--Pelec Island. ....	1901	.....	17			
".....	On Pelee Island.....	1889-1900	13½	.....			
North-west.....	Qu'Appelle--Edmonton.. ..	1883	598½	.....	598½	15	9,500
".....	Moosejaw--Wood Mountain.....	1885	90½	.....	90½	2	300
".....	Duck Lake--Batoche.....	1902	9	.....	12½	3	200
".....	Duck Lake--Indian Agency... ..	1902	3½	.....			
".....	Edmonton--St. Albert. ....	1887	9	.....	36	3	
".....	St. Albert--Qui Barre and Alexandria..	1902	27	.....			
British Columbia	Ashcroft--Quesnelle (local wire).....	1878-87	215	.....	215		
".....	Victoria--Cape Beale.....	1891	118	.....	118	6	800
".....	Nanaimo--Comox.....	1893	81	.....	81	8	
".....	Parksville--Alberni.....	1895	29½	} .....	86½	2	8,000
".....	Alberni--Cape Beale.....	1899	57				
".....	Alberni--Clayoquot....	1902	96¾	.....	96¾	4	550
".....	Kamloops--Lower Nicola.....	1899	67	.....	67	9	1,400
".....	Golden--Windermere.....	1901-2	92	.....	92	4	1,500
".....	Duncan Sta.--Salt Spring Isl.....	1902	15	¾	15¾	2	
Yukon.....	Ashcroft--Dawson and Boundary.....	1899-1901	1845	} .....	2,252½	53	42,000
".....	Hazelton--Port Simpson and Aberdeen.	1901-1902	202½				
".....	Tagish--Cariboo Crossing.....	1901	18				
".....	150 mile Sta.--Quesnelle Forks.....	1902	64				
".....	Ashcroft--Lillooet.....	1896	62				
".....	Quesnelle--Barkerville.....	1887	61				
	Total end of 1903.....		5,897½	344¼	6,241¾	259	96,500



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## REPORT ON THE GOVERNMENT TELEGRAPH SERVICE FOR 1902-3.

## EXPLANATORY NOTES.

The tabular statement prefacing this report shows the total mileage, &c., of the telegraph lines operated by the government. Lines that have been subsidized or constructed and transferred by the government for operation by private companies are not included in this list.

The matter in the following pages comprises merely a statement of specific actions taken in the course of the year, and in any case where no particular reference is made to a line found mentioned in the list, the understanding intended to be conveyed is that that line has been satisfactorily operated throughout the year, without any change of conditions since last made mention of in the annual reports.

## NEWFOUNDLAND.

The line from *Port au Basque* to *Cape Ray* continued to be operated as heretofore, under an arrangement with the Anglo-American Telegraph Company.

## MARITIME PROVINCES.

NEW LINES IN CAPE BRETON.—Of the proposed new lines mentioned in last year's report, two sections were contracted for and carried to completion. Native poles (spruce and tamarack) 25 feet long and 5 inches at the top were used in the construction, along with No. 6 galvanized iron wire, white porcelain insulators and oak brackets, supplied by the government. Mr. Ronald McInnes, of Port Hood, was contractor for the poles and construction of the Mabou-Port Hawkesbury section, and completed the work in May, 1903. This line measured 42½ miles. Mr. Murdock Cameron, of Mabou, was contractor for the Port Hawkesbury-St. Peter's section, also completed in May, 31½ miles. Both lines were built under the supervision of Mr. Jas. Hardy, of Gabarous, and arrangements for the establishment of offices were in hand at the close of the fiscal year. A contract was entered into with Messrs. Ahearn & Soper, Ottawa, for lines of the same description as above from St. Peter's to Scatarie, estimated 90 miles, and Gabarous to North Sydney, estimated 25 miles, and that firm has them now under construction.

NORTH SYDNEY—MEAT COVE AND MABOU LINES.—The operation of these lines continued as in the preceding year. The Western Union Telegraph Company having afforded connection between North Sydney and Mabou, the business exchanged with Meat Cove and the Magdalen islands and beyond was routed direct or via Mabou as occasion required.

Nothing beyond ordinary repair work, performed by the regular staff was called for during the year.

A *general repairer* in addition to the sectional linemen for the stretch from Meat Cove to Mabou and Port Hawkesbury was found to be required, and W. J. Smith, of Port Hood, was appointed July 1, 1903. A similar arrangement in regard to the Meat Cove-North Sydney line is contemplated, as calculated to render unnecessary a periodical overhauling of the line by experienced repairers belonging to the telegraph company (W.U.), who have so far lent us their assistance as occasion required.

ENGLISHTOWN-BADDECK REPAIR SECTION.—This is now being attended to by temporarily employed labour on occasion, the former local lineman being at too great a distance for prompt service. His engagement ended June 30, 1902.



## SESSIONAL PAPER No. 19

MARGAREE HARBOUR-CHETICAMP REPAIR SECTION.—This is now divided, Mr. A. Munro having retired June 1, 1903, and been succeeded by H. K. McLean for the Margaree Harbour-Grand Etang half, and M. Lindee for the Grand Etang-Cheticamp section.

At *Ingonish Ferry* (Cowan's Cove Beach) an office was opened, June 29, 1903, with Mr. G. H. Hackett in charge as agent-operator.

At *Cape St. Lawrence* an office was arranged for in June with a view to the establishment there of a station for the signal service next season. An operator is being instructed to that end.

At *Broad Cove* the office was found to be inconveniently remote from the growing settlement about the mines. To meet the requirement, a loop from off the main line, 3 miles, was constructed, and our agent removing to the new site (Inverness) continues in charge of the office. (This change was made on October 20, 1903.)

BOULARDERIE ISLAND.—Provision has been made by Parliament for the construction of a telegraph line from Big Bras d'Or to Upper Kempt Head, a distance of 20 miles. The poles of local wood will be got out in the course of the winter, in readiness for the building of the line early as may be practicable next season.

MAGDALEN ISLANDS.—At Point Basse, 4 miles from House Harbour, an office was opened August 1, 1902, with Mr. H. Arseneau as agent operator. This connection has been made by an extension of the House Harbour loop line.

The renewal of the wire provided for as mentioned in last year's report was proceeded with in the course of the season, and in consequence of the pole line being found in a weak condition its renewal throughout was considered advisable. A quantity of poles (960 cedars, 25 feet long and 6 inches diameter at the top) were procured from Gaspé and for most part distributed in the course of the season, and it is proposed to supply the further requirement in poles and wire to complete the entire renewal next year.

The *Etang du Nord* sand bar stretch referred to in last year's report was in the month of August, 1902, spanned by cable; 5½ knots I.R. 2-ton type imported for the purpose; and a further length of one knot of the gulf d.s.g.p. type added at the Amherst Island side to avoid the construction of several miles of land line over swampy ground that it was found would otherwise have been required to meet it. That Amherst-Etang du Nord section has been free of trouble since this improvement was made.

The cable between Old Harry and the mainland was interrupted on May 29 through damage between high and low water, in a storm at Meat Cove landing. It was restored to working order on June 2 by our local agent, Mr. A. B. McDonald.

At *House Harbour*, June 1, 1903, Mr. Camille Delaney was appointed agent as successor to Mr. P. L. Joncas, deceased.

ANTICOSTI ISLAND.—The repair of the cable between Long Point and Mechastic bay, that had been interrupted since October 24, 1902, as mentioned in last year's report, was deferred until after the close of the fiscal year, as the services of the repair ship *Tyrian* were required elsewhere, and communication with Anticosti was being maintained by the cables from Gaspé and via Bryon Island. (Note.—This Long Point-Mechastic bay cable was put in order by the ss. *Tyrian* in August, 1903.)

On December 19, 1902, the newly laid cable between Anticosti and Bryon Island was damaged and broken in a storm close to the beach at the Heath Point landing. It was, however, readily got at and the connection was restored by our local agent, Mr. A. Tremblay on the 23rd.

At *Fox Bay* a special building for office and dwelling of the telegraph agent was erected in the autumn of 1902, by some workmen from Halifax under the immediate supervision of an officer from the department at Ottawa, Mr. F. X. Breton. The ss. *Tyrian* landed the material and passengers, and subsequently returned for the latter in the course of some cable work in the vicinity.



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At *South Point lighthouse*, Mr. A. Nadeau, who had been in charge of the telegraph agency since 1888 passed away in a sudden illness on October 25, 1902. Mr. B. Bradley was temporarily transferred to that office from Shallop Creek.

The position of general repairer, which had been filled since 1896 by Mr. Z. Beaudin at Salt Lake, became vacant in consequence of his resignation and leaving the island, and Mr. A. Allard, who had been temporarily acting, was appointed to succeed him, June 1, 1903.

BRYON ISLAND.—The cables laid in November, 1902, as mentioned in last year's report, were landed in the cove at the south-eastern end of the island; and from the terminal hut a two-wire land line was carried a distance of a mile to the house of Mr. W. Dingwell, who has taken the agency. The office was in charge of an instructor (Miss B. Bingham) during the winter. As thus connected in circuit Bryon Island is a way office on the Magdalen Islands-Anticosti line.

*Bay of Fundy lines*.—The cable,  $7\frac{1}{4}$  knots, between Grand Manan and Campobello, ceased working on March 11, 1903. The *Tyrian* could not be put into service till after the close of the fiscal year, and so the repair had in consequence to stand over.

(Note.—This cable was taken in hand in the middle of July, and communication was restored on July 25. In the course of the work the cable was found very badly deteriorated in the vicinity of the Liberty Point (Campobello) landing, so instead of renewing it there, the abandonment of that spot as contemplated on the last occasion for repair was carried out, and the landing place was changed to the further end of Herring Cove; the land line being at the same time shifted to meet it. While the cable-ship was in the neighbourhood an aerial stretch between Grand Manan and Ross Island (Cheney's Island line) that had been supported by three tall masts, fallen into decay, was replaced by a length of 1,000 feet of deep sea cable g.p. gulf type from the stock on board.)

At *Whitehead Island*, in January, 1903, the former agent, Mr. J. D. Harvey, resigned the office and was succeeded by Mrs. Webster Cassaboom.

NORTH SHORE ST. LAWRENCE LINES.—Considerable construction work was undertaken in the Chicoutimi district in the course of the year. The gap between Anse St. Jean and St. Etienne (21 miles) was filled in; a line from Chicoutimi via St. Anne and Shipshaw to St. Charles (37 miles) was in hand at the close of the fiscal year, and further extensions from St. Anne to Lac Claire (17 miles) and Descente des Femmes (10 miles) had been decided upon; likewise branch lines from Bay St. Paul to Petite Rivière (12 miles) and Murray Bay to St. Agnes ( $14\frac{1}{2}$  miles).

All of these lines have since been built, as noted in the list prefacing this report. In the construction, cedar poles 20 feet long, 6 inches diameter at the top, and No. 6 galvanized iron wire, with white porcelain insulators, and oak brackets were used. The work in each instance was done by days' labour under the supervision of an officer of the department.

The office or repair station, formerly at Lacruche, has been discontinued, the repairer, A. Gauthier, having removed to St. Urbain. In the same neighbourhood, however, an office has been established at LaGalette with S. Oulette in charge since August 25, 1902.

At *Otis* (St. Felix d'Otis), on the line between St. Alexis and Anse St. Jean, an office was opened on June 30, 1903, at that date in charge of a teaching operator.

At *St. Catharine's Bay*, near Rivière au Canard, an accommodation office for the firm of Price Bros. was opened in April, 1903.

At *Tadousac*, for the greater convenience of the community, an office was opened in July, 1902, at the Tadousac hotel for the summer months.

*Scougalls Mills*, Manicouagan.—The loop line built in the spring of 1901, as mentioned in the report for that year, from Pointe Paradis to a point on the river opposite the mill, was in August, 1902, carried further up across the river to the mill, a distance of nine miles. The mill company supplied and put up the poles and the department furnished the material (18 miles No. 6 wire, with insulators, brackets, &c.)



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MANICOUAGAN CABLES.—On December 12, 1902, in the presence of the circumstance that the Long Point-Anticosti cable was out of order, an interruption occurred somewhere between Bersimis and Godbout, so cutting off the whole of the north shore telegraph below that section. Pending the result of the investigation for the trouble, a courier service was established for the exchange of messages; and in January, the interruption having finally been traced to the cable between Manicouagan and Godbout, arrangements were made for the forwarding at first to and from Point Outardes and later between Scougalls mill and Godbout. This service, the couriers making two trips per week each way, was continued until April 22, when the passing of ice and bad weather admitted of an examination of the cable by our local agent, Mr. N. A. Comeau, of Godbout, who found it parted  $3\frac{1}{2}$  miles from the beach at Manicouagan, and succeeded in effecting a repair and restoring the connection. In consequence of the experience here related, and the liability of the north shore being cut off by such troubles in the Manicouagan cables, the department had decided upon the construction of a land line between Bersimis and Godbout, and provision has been made in the estimates for such a line, to be built in the course of the coming year.

SHELDRAKE-ST. JOHN'S RIVER TELEPHONE WIRE.—For the accommodation of the firm of Messrs. Robin, Collas & Co. the privilege of putting a telephone wire on the telegraph pole line between those two places, a distance of  $29\frac{1}{2}$  miles, was granted in August, 1902, the firm engaging to pay an annual rent therefor.

*Clarke City.*—At this new place, between St. Marguerite and Seven Islands, an office was opened on April 17, 1903, for the accommodation of the firm operating the pulp mills.

*Labrador Extension.*—It will be seen by reference to the tabular list of offices on the north shore, in the appendix to this report, a considerable number of repair stations has been added to those established when the line was first opened up beyond Point Esquimaux. On occasions when line troubles called for attention, there was often difficulty in finding men ready to engage for the work, because of their fishery interests, and the expedient of securing such occasional services by fixed allowances, was had recourse to. Several repair sections in charge of regular linemen have been established, and the local repairers, stationed at the offices in those sections, are at hand for the removal of line troubles in their immediate neighbourhood. These arrangements were effected by an officer from the department, Mr. A. Boyer, who was specially appointed to go over the ground for the purpose, and it is expected that with these provisions for the up-keep of the line will be maintained in good and reliable working order all the way through. Although the maintenance of the line under these conditions is expensive, it is likely less so than any other means of reaching the far Labrador would be; and it may perhaps not be inopportune to mention here that the whole is in consonance with the view taken by the department at the outset when the construction of this land line in lieu of a system of cables, as had been contemplated, was determined upon. In a report upon the matter submitted by the writer to the Honourable the Minister of Public Works, under date December 6, 1895, and in which comparative estimates were given of the cost of cables and of a land line, the construction of a land line was advocated, for several reasons, and amongst other advantages that such a work would afford it was pointed out that: The suggested cable connection (between Anticosti and Belle Isle, ref. report of September 6, 1889) would hardly fall in with the original scheme under which the existing line has been carried to Point Esquimaux. This line is fulfilling a very useful purpose, and its further extension would no doubt prove a great boon to the scattered settlements along the coast; besides which the maintenance of a land line would give employment to some of the people, and contribute to their means of livelihood, an advantage that would be lost (without any saving) were the telegraph laid under water all the way.



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BELLE ISLE CABLE.—This cable, which was repaired on July 18, 1902, as mentioned in the last annual report, was again damaged by ice in February, 1903, but communication was had through it by telephone until June 23, when it gave out, probably owing to further damage, as there were then some icebergs in the straits. On June 27, however, it was again found workable by telephone at prearranged intervals.

(NOTE.—This condition continued until the ss. *Tyrian* visited the locality in August. The damage was located on the Belle Isle side, and three badly crushed spots were found within a mile of the landing there. In one spot, about 500 feet off the shore, in 17 fathoms of water, the 12-ton locked-armour shore end was crushed flat. The repair was completed on August 29, 1903.)

MARCONI WIRELESS TELEGRAPH STATIONS.—These stations at Chateau Bay and Belle Isle, 20 miles apart, have continued to be operated daily, with but one or two interruptions, due to the local instrument troubles, that were found and rectified by the operators, ever since they were put in satisfactory operation, August 1, 1902.

(NOTE.—In the course of the past season, September, 1903, a mast, in three lengths, of the same height as the first one—150 feet—was erected at a spot about  $\frac{1}{3}$  of a mile from the latter at Chateau Bay, for the purpose of demonstrating the practicability of operating it from that location, which is in front of very high ground, and affords the only desirable site for a dwelling in the neighbourhood. The system was found to work equally well under these conditions. The mast remains there in readiness for use in event of the erection of a building being decided upon. The aerial wire, &c., were returned to the first mast, and the operating hut was overhauled and put in better shape, as in its exposed position it had been found too light and thin for the rigour of the preceding winter.)

GROSSE ISLE QUARANTINE LINE.—Communication beyond St. François, Orleans island, became interrupted on January 23, 1903. Subsequent investigation placed the trouble in the cable stretch between Isle aux Réaux and Grosse Isle, but it was impracticable to attempt repair until after the ice moved down in the spring, and it was not till May 19 that, after many detentions of the boats by bad weather, communication was restored. The trouble was due to ice catching the cable at the inner side of the channel off Grosse Isle, and straining the section towards shore to such a degree as to produce a disruption of the conductor at the junction of the old and new types of cable described in last year's report.

## ONTARIO.

PELEE ISLAND LINE.—The Pelee Island cable is in the same condition as reported last year. The break that occurred on July 3, 1902, was repaired on the 25th of the same month by the local superintendent, Mr. J. M. Selkirk, of Leamington; but it was broken again on September 12, and repaired on November 7, and gave out again in 11 days later. An attempt to restore the communication was made in the month of May, 1903, but it only lasted three days, 16th to 19th—since when the proposed change of route or importation of additional new cable to replace the older portion of the stretch has been under consideration in the department.

## NORTH-WEST.

WOOD MOUNTAIN LINE.—In consequence of the country through which a part of this line runs having been settled and put under cultivation, the desirability of shifting the line from its present location in places so as to follow the road allowances that have been provided, has been brought to the notice of the department, and arrangements are being made for the requisite supply of poles for this purpose, and likewise for renewals of the pole line in several sections that were swept by the prairie fires that occurred during the absence of rain late in the autumn of 1902 and last spring.



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WILLOW BUNCH.—A projected extension of the Wood Mountain line to Willow Bunch ; 38 miles is being provided for in the estimates for next year.

QU'APPELLE-EDMONTON LINE.—There were no serious interruptions throughout the year; and in any case, as has already been mentioned in these annual reports, the circumstance of our line making connection with the Canada Pacific Telegraph system at several points affords the means (merely at the cost of extra tolls) for the routing around of messages between points on our line that might happen to be temporarily severed by line troubles. The damage caused by prairie fires has called for a renewal of the poles in several sections, and these are being arranged for. As an interesting contribution to our knowledge of existing conditions, the following might well be quoted from a report presented by Mr. Macdonald under date November 3, 1902:—

‘I find that the life of the tamarack pole is about equal to that of cedar, while, on account of its hardness and smoothness it resists fire very much better. In fact, for the first few years, it is practically invulnerable to prairie fires. To secure tamarack poles it will be necessary to arrange early, as they are taken from swamps, accessible only during the winter.’

As it had been the practice heretofore to procure cedar poles whenever practicable and not too costly, this information might perhaps prove valuable to others besides the government having to do with pole lines in the North-west Territories.

At *Moose* the office closed in June, 1902, upon the transference of Agent J. W. Carroll to Saddle Lake, was reopened August 1, 1902, with G. G. Mann as agent-lineman.

RIVER QUI BARRE AND ALEXANDRIA.—In August, 1902, the extension of the Edmonton-St. Albert telephone line to River Qui Barre, 21 miles, was put in hand, and later on the further extension to Alexandria, 6 miles, was carried out. Local wood for the pole line and No. 9 galvanized iron wire were used in the construction, which was done under the immediate supervision of the district superintendent, Mr. J. S. MacDonald.

At *Saskatoon*, in June, 1903, an old and devoted employee of the service passed away in the decease of Mr. J. Harrington, who had acted in the capacity of lineman in that section since January, 1888. The position was temporarily filled pending an appointment. (Note.—Appointment since made: Geo. Clement, October 1, 1903.)

## BRITISH COLUMBIA.

ALBERNI-CLAYOQUOT LINE.—This line, the construction of which was had in view last year, was built under contract by Mr. M. J. Conlin, and put in operation on December 1, 1902. The line runs from Clayoquot townsite along the coast, thence via the narrows on Effingham inlet and along the shore of Alberni canal (86 $\frac{3}{4}$  miles) to a point opposite Franklin creek, where a cable ( $\frac{1}{2}$  mile) crosses the canal and connects with Alberni by a wire (10 miles) on the previously existing pole line. Total length, 96 $\frac{3}{4}$  miles. Offices have been opened at Ucluelet, Clayoquot and Stubbs island (the latter an accommodation office for a private firm).

ALBERNI-CAPE BEALE LINE.—This section is being maintained and operated in conjunction with the Canadian Pacific telegraph, in connection with the Pacific cable at Bamfield creek.

NANAIMO-COMOX LINE.—The repair sections of the Alberni and Comox lines at Parksville have been separately attended to since December 1, 1902, when the joint arrangement with the Canadian Pacific Railway began. Since June 1, 1903, a regular lineman, W. Mills, has been appointed for the Parksville-Quellicum (Comox line) section.

VICTORIA-CAPE BEALE LINE.—In consequence of the rough environment of this line, it continues to be difficult of maintenance in reliable operation, as explained in earlier annual reports. At times, however, when the interruption is in but one spot



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the offices on either side of the trouble can exchange messages by way of the connecting company's line via Nanaimo.

**SALT SPRING ISLAND TELEPHONE LINE.**—With a view to rendering this connection of greater utility, the department is making provision for the further extension of it a distance of 9 miles to reach an important centre on the island. The present line extends, as mentioned in last year's report, from Duncan station, on Vancouver island, to Edwards store, on Salt Spring island, 15 $\frac{3}{4}$  miles.

#### YUKON.

*(This division embraces the Ashcroft-Quesnelle B. C. line and branches.)*

A complete list of offices and testing stations, with intermediate distances as recently revised, will be found in the tariff sheets in the appendix to this report; also amongst the tabular statements of offices, &c., a complete list of the staff employed on the Yukon system.

**New Branch Line.**—A line from 150 Mile House to Quesnelle Forks, a distance of 64 miles, was built under contract by Mr. J. C. Shields, of Ashcroft, and completed and put in operation on November 1, 1902. Poles of local wood and No. 8 galvanized iron wire were used in the construction.

#### TELEGRAPH SERVICE GENERALLY.

**Cables ship.**—Owing to there being no available appropriation, the ss. *Tyrian* was not got ready so early in the season as she might otherwise have been for the work that was to be undertaken. Hereunder is a memorandum of the vessel's movements, and estimated proportion of time chargeable to the different works indicated. The whole of the work taken in hand was successfully carried out; and the ship was got about expeditiously.



## SESSIONAL PAPER No. 19

## MEMORANDUM OF SERVICES OF THE SS. TYRIAN, SEASON, 1903.

			Days.	
1- 6	July	Preparations for sea.	31	Repairing Grand Manan-Campobello cable; and substitution of 10 ft. cable (gpds) for aerial stretch between G.M. & Ross Island.
7- 9	"	En route Grand Manan.		
10-26	"	G.M.-Campobello cable.		
27-28	"	G.M. Ross Island.		
29-31	"	En route to Halifax.		
1- 5	Aug.	Preparations for sea.	22	Repairing Long Point-Anticosti cable.
6- 9	"	Coaling Sydney.		
10-11	"	En route Long Point.	10	Repairing Belle Isle cable.
12-18	"	Long Point Cable.		
19-22	"	Supplies at Gaspé.	13	Erection of Second Marconi mast in new position.
23-24	"	En route Chateau Bay.		
24-31	"	Belle Isle Cable.		
1-11	Sept.	Marconi Mast.	6	Examination Bryon cables, and Coaling at Sydney.
12-14	"	En route Gaspé.		
15-16	"	Bryon Island.	10	Del. renew. Chat. Bay & Belle Isle for Marconi station.
17-20	"	Coaling, Sydney.		
21-24	"	En route Chateau Bay.		
25-30	"	Marconi renewals.	3	Install. of Auto. Rep., Heath Point and remov. local trouble S.P.Ant.
1	Oct.	En route Heath Point.		
2	"	Heath Point, South Point.		
3	"	Bryon Island.	2	Rep. Bryon Island-Grosse Isle cable.
4	"	Heath Point, &c.		
5	"	En route St. Peters.		
6- 7	"	St. Peters Canal.	3	Laying cable stretch (200 feet) across canal at St. Peters.
8	"	Provisions, Baddeck.		
9	"	Scatari and Main à Dieu.		
10-12	"	En route Halifax.	4	Examination of cable and placing guards at Scat. & Man.

Total 104 days.

There was a subsequent run to Cape Sable for examination of the cable there, and for a while the ship did duty for the Department of Marine before going into winter quarters.

As a great deal of credit is due to the ship's commander and those associated with him during the season, it is with no small sense of gratification that the writer is able to record here, in addition to the foregoing, that just as the *Tyrian* was housed and at rest for the winter (December 9, 1903), an application was received from the Direct United States Cable Company for her services for the purpose of making a repair in their Rye Beach section. The ship was forthwith (at the cost of the company) refitted and proceeded to work. As a result a letter shortly afterwards came to hand from the company's superintendent at Halifax, Mr. S. Fenn, from which the following may well be quoted:—

'You will have heard of our record repair . . . . We were only 36 hours away and actually only 12 at the work. In Captain O'Leary, Chief Engineer Zwicker, and the boatswain (Mr. Wm. Goodwin), the department have three excellent officers. I was impressed by the quiet methodical and business like way in which the work on board was carried out.'

This commendatory message is gladly taken note of here, as its intention can but be thoroughly appreciated in behalf of and by every member of the staff and ship's



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company who had a hand in this interesting expedition. The break in the cable was in deep water (about 125 fathoms), 20 miles from Halifax.

## REVENUE AND EXPENDITURE.

The revenue and expenditure for each of the lines in the several districts hereinbefore mentioned are given in the following table:—

1902-03.	Expendi- ture.	Revenue.	Remarks.
	\$ cts.	\$ cts.	
Lower St. Lawrence and Maritime Provinces :—			
Anticosti Island lines.....	4,394 76	1,677 11	Signal Service messages, Meteorological Service messages, reports and Fisheries bulletins are handled free of tolls.
Bay of Fundy ".....	2,749 07	743 95	
Cape Ray ".....	500 00		
Cheticamp ".....	2,654 44	1,305 86	
Escuminac ".....	634 80	137 95	
Magdalen Islands, and Bryon Island lines.....	4,924 82	1,011 65	
Father Point Agency.....	500 00		
Meat Cove line (including St. Paul's Island).....	4,784 22	231 85	
North Shore St. Lawrence (East of Bersimis) (including \$346.45 for Bouchard.....	18,258 02	3,262 29	
" " (West of Bersimis).....	6,027 42	1,784 62	
Quarantine line.....	4,750 15	426 30	
Cable ship <i>Tyrian</i> , renewals of plant, &c.....	36,669 69		
Subsidies, stationery, line and office material and contingencies, chargeable to appropriation for Gulf lines.....	6,568 76		
Total for Lower St. Lawrence, &c.,.....	93,446 15	10,581 58	
Ontario, Pelee Island line.....	396 84	73 95	
North-west telegraph lines.....	20,000 00	3,560 43	
British Columbia, Alberni-Cape Beale line.....	1,118 00	13 16	
Alberni-Clayoquot line.. ..	1,856 53	91 17	
Golden-Windermere line.....	2,589 32	453 85	
Kamloops-Nicola .....	684 05	710 12	
Comox (including Alberni line).....	3,817 00	2,430 46	
Vancouver-Salt Spring Island line.....	179 10		
Victoria-Cape Beale line.....	4,607 21	424 09	
Carriboo-Lillooet.....		477 43	
Yukon, Bennett-Dawson .....	242,211 51	113,605 93	
Telegraph service generally.....	2,442 58		
Total.....	373,348 29	132,422 17	



## SESSIONAL PAPER No 19

## DEPARTMENTAL TELEPHONE SERVICE.

At the end of June, 1903, the telephone connections with the central office of the Bell Telephone Company at Ottawa, listed as chargeable to the special appropriation, numbered 228, the annual charge for which amounts to \$8,757. These connections are distributed amongst the several departments as hereunder:—

Department.	Offices.	Residences.	Annual charge.
			\$ cts.
Agriculture.....	5	3	305 00
Auditor General ..	2	1	115 00
Census.....	2	2	163 00
Customs.....	3	2	185 00
Finance ...	4	2	203 00
Government House ..	4	3	308 00
House of Commons.....	13	3	620 00
Inland Revenue ..	4	5	320 00
Interior.....	16	5	810 00
Geological Survey.....	2	1	110 00
Mounted Police.....	2	1	120 00
Indian Affairs.....	2	1	110 00
Justice.....	5	8	470 00
Exchequer. ..	1	2	105 00
Dominion Police. ..	6	2	313 00
Marine and Fisheries.....	5	4	338 00
Militia and Defence ..	12	9	812 00
Post Office.....	6	2	315 00
Parliamentary Library.....	1	2	120 00
Privy Council.....	4	5	335 00
Railways and Canals.....	4	3	270 00
Secretary of State ..	3	2	180 00
Public Works.....	23	12	1,395 00
Ottawa River Works. ..	3	.....	155 00
Stationery Department. ....	3	3	210 00
The Senate.....	3	1	140 00
Trade and Commerce.....	2	3	180 00
Labour Department.....	1	.....	50 00
	141	87	8,757 00

## APPENDED TABLES.

The usual tabular statements of the lines and offices, staff, &c., of the telegraph service, following hereupon, will be found to contain whatever additions or changes have been made up to June 30, 1903.

D. H. KEELEY,

*General Superintendent.*

OTTAWA, January 18, 1904.



GOVERNMENT TELEGRAPH SERVICE.  
NEWFOUNDLAND TELEGRAPH SERVICE.

No.	Stations.	Interme- diate Distance.	Agent and Operator.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Port au Basque.....	0	.....	50 00 or commission..	.. .. .	N.B.—The commission is 25 per cent upon all busi- ness to and from the office; said commission guar- anteed not to be less than at the rate of \$50 per annum.
2	Cape Ray Lighthouse.....	14	.....	50 00 "	.. .. .	
	Total.....	14		100 00 "	.. .. .	

N.B.—The above short line is constructed in connection with the Signal Service, and connects at Port au Basque with the land line system of the Anglo-American Telegraph Company.



GOVERNMENT TELEGRAPH SERVICE—Continued.  
ANTICOSTI TELEGRAPH SYSTEM.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Fox Bay.....	0	Geo. Cabot .....	300 00	May 13, 1900 .....	Increased from \$200 since December 1902.
2	Heath Point.....	23	A. Tremblay.....	50 00 or commission..	Aug. 1, 1900 } .....	For local agency.
3	South Point Lighthouse....	32½	.....	200 00 "	Nov. 1, 1902 } .....	For cable repeating station.
4	Shallop Creek.....	17½	.....	50 00 "	.....	Mr. A. Nadeau former agent deceased and B. Bradley of Shallop Creek in charge since January 1903.
5	Salt Lake.....	52½	A. Allard, agt. repairer	240 00 "	July 7, 1881.....	Temporarily closed since January.
6	South-west Pt. Lighthouse.	15	A. Z. Lemieux .....	360 00 "	June 1, 1903.....	Plus \$1 per day when on duty as general repairer.
.....	Jupiter River .....	7	.....	420 00 "	" 1, 1901.....	Increase from \$300 since May 1903.
.....	Otter River.....	17½	.....	50 00 "	.....	
.....	Becscie River.....	22	.....	50 00 "	.....	
.....	Cape Eagle (Ellis Bay)....	10	.....	50 00 "	.....	
7	West Point Lighthouse....	9	A. Malouin, dist. supt.	344 00 per annum. ....	Aug. 1, 1900.....	
8	English Bay.....	3	" operator..	50 00 "	" 10, 1881.....	
.....	Mechastic Bay (cable land- ing).....	14½	F. Cabot.....	300 00 and commission	July 1, 1882.....	Increased from \$120 since December 1, 1902.
	Totals....	223½	.....	.....	.....	
				2,514 00		

South-west Point connects with l'Anse à Fougère, Gaspé, by cable 44½ knots ; and from Mechastic Bay connection is made with Long Point of Mingan by cable 21 knots.

0	L'Anse à l'ougère .....	.....	N. Bernier.....	17 00	.....	Special allowance for the cable terminus. A testing station only.
1	Gaspé Basin.....	28	J. J. Annett .....	420 00	Oct. 16, 1881.....	Transfer office. Connection with G.N.W. telegraph system.
		28		437 00		



GOVERNMENT TELEGRAPH SERVICE—Continued.

MAGDALEN ISLANDS SYSTEM.

MAGDALEN ISLANDS SECTION.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Amherst.....	0	Miss J. Shea.....	50 00 or commission..	Oct. 1, 1882.	The commission is 25 per cent on all business to and from the office in each instance; said commission guaranteed to be not less than at the rate of \$50 per annum.
2	Amherst Lighthouse..	9	Wm. Cormier.....	50 00	June 11, 1881.	Plus \$1 per day when absent on duty.
3	Etang du Nord village. .	15	{ I. G. Binet, gen. repairer..	400 00	Dec. 1, 1900.	Two-wire loop line.
4	Etang du Nord Lighthouse.	1	{ Mrs. A. Binet.....	50 00	" 1, 1881.	Plus \$1 per day when absent on duty.
5	Grindstone Island. ....	5	{ N. Arseneault.....	50 00	Sept. 1, 1891.	Plus \$1 per day when absent on duty.
6	Grindstone West.....	...	{ W. Leslie.....	Commission 25 p.c. ....	May 20, 1897.	
7	House Harbour ( $\frac{1}{2}$ knot cable)*.....	3	{ A. LeBourdais, dist. supt..	600 00	Aug. 17, 1880.	
8	Wolfe Island..	28 $\frac{1}{2}$	{ Mrs. LeBourdais, operator.	50 00	Sept. 15, 1893.	
9	Grosse Isle.....	11	Camille Delaney.....	50 00 or commission..	June 1, 1903.	Mr. P. L. Joncas former agent deceased.
10	Grand Entry.....	11	{ N. Clark.....	50 00 or commission.	" 1, 1888.	For local agency.
			{ Mrs. F. Atkins.....	360 00	Dec. 1, 1902.	For repeating station.
				50 00	Feb. 18, 1882.	
		83 $\frac{1}{2}$		1,760 00		
11	*Point Bass—2 Wire loop from House Harbour....	4	H. Arseneau.....	50 00 or commission..	Aug. 1, 1902.	
12	Bryon Island.....	1	W. Dingwell.....	150 00	Jan. 1, 1903.	Two wire loop line from terminal hut for Grosse Isle and Anticosti cables.

Grosse Isle connects at Old Harry with Meat Cove, C.B., by cable 55 knots; and connects with Bryon Island by cable 11 knots; thence to Heath Point Anticosti 93 knots.



SESSIONAL PAPER No. 19

CAPE BRETON SECTION.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
1	Meat Cove (cable station)...	Miles. 6	A. B. McDonald, Circuit Manager.....	720 00.....	Nov. 7, 1880.	Salary. \$500 per year previous to Sept. 1, 1901. The commission is 25 p.c. on all business to and from the office in each instance; said commission guaran- teed to be not less than at the rate of \$50 per annum.
2	Aspy Bay. . . . .	10½	I. Y. Nichols. . . . .	50 00 or commission	July 1, 1894.	The loop line formerly running to White Point has been withdrawn.
3	Dingwall (loop line).....	3¼	Murdock McLeod.....	50 00 "	Aug. 31, 1898.	
4	Neil's Harbour (half-way house loop line).....	14 } 13¼ }	M. McLeod.....	50 00 "	April 1, 1887.	25 per cent commission only. Switching point for Baddeck line.
5	Ingonish North Bay.....	9	J. M. Burke.....	50 00 "	" 1, 1882.	
6	South Ingonish.....	10½	Geo. Brewer.....	50 00 "	May 7, 1899.	
7	Ingonish Ferry.....	2	G. H. Hackett.....	50 00 "	June 29, 1903.	
8	French River ¼ knot cable.	21	John McDonald.....	50 00 "	April 1, 1899.	
9	Indian Brook.....	5	Annie McDonald.....	50 00 "	Aug. 1, 1901.	
10	Murray (loop line).....	14 } 10 }	R. B. Matheson.....	25 p.c. R & Cks	Jan. 20, 1902.	Closed December 31, 1899. Guaranteed comm'n was \$50 prior to March 1, 1900. This loop to Baddeck starts from and returns to Englishtown.
11	Englishtown ¼ knot cable... South Gut, St. Ann's (on loop).....	7	W. Bingham.....	120 00 and commiss..	July 19, 1882.	
12	Baddeck (on loop).....	5	.....	50 00 "	.....	The commission is 50 p.c. on local business and 25 p.c. on through messages; and covers supervision of line and office accommodation at North Sydney.
13	Englishtown (back on loop)	13	A. Anderson.....	120 00 "	Dec. 2, 1898.	
14	Kelley's Cove, N. Camp- bellton .....	18	.....	.....	.....	
15	Big Bras d'Or ¼ knot cable. North Sydney. ....	6 2½ 12½	Miss M. Campbell Mrs. F. Livingston.. W. U. Tel. Co.....	50 00 or commission 50 00 " ..... Commis'n only	April 1, 1885. Jan. 1, 1889. .....	Increased from \$80 since June 1, 1903. This section attended to on occasion by locally emp- loyed labour since July 1, 1902.
	<i>Repairers' Sections.</i> Meat Cove—Sugar Loaf... Sugar Loaf—Ingonish... Ingonish—Englishtown... Englishtown—Baddeck... Englishtown—N. Sydney... Murray—Indian Brook...	..... ..... ..... ..... ..... .....	M. McAskill... Charles Smith... R. A. McDonald... ..... M. D. McLeod... John Smith.....	80 00 100 00 80 00 ..... 60 00 25 00	April 1, 1898. " 1, 1898. " 1, 1898. " 1, 1898. " 8, 1902. June 17, 1902.	
	Totals.....	168½		1,855 00		

Meat Cove station connects with the Magdalen Islands system by a cable to Old Harry Head, 55 knots, and with St. Paul's Island by a cable of 20 knots. The latter is operated with telephones.

1	St. Paul's Island.....	3	S. C. Campbell .....	50 00	Oct. 1, 1890.	Land wire across the island, Atlantic Cove to Trinity Cove.
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3-4 EDWARD VII., A. 1904

GOVERNMENT TELEGRAPH SERVICE—Continued.  
MABOU-CHETICAMP AND MEAT COVE, C.B., TELEGRAPH SYSTEM.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Mabou.....	0	Mrs. M. McDonald.....	120 00 per annum...	April 1, 1887.	The commission is 25 p. c. of the Government line tolls, and is guaranteed to amount to not less than \$50 per annum. Where 50 p. c. commission is paid there is no guarantee as to amount.
2	Broad Cove .....	20	Mrs. Annie McLelland.....	50 00 or commission	Mar. 1, 1892.	
3	South-west Margaree .....	12	J. D. McFarlane.....	50 00 " " "	*Feb. 1, 1898.	
4	Margaree Harbour.....	5	H. K. McLean.....	50 p. c. R. & Cks	Oct. 20, 1896.	
5	North-east Margaree (loop line wire).....	10	Mrs. J. D. Ross. ....	50 00 or commission	Feb. 1, 1898.	This office re-opened after having been closed since January 1899. *At South-west Margaree the commission was 50 p. c. till Sept. 1, 1899.
6	Grand Etang. ....	8	G. Doucet.....	50 00 " "	Sept. 13, 1902.	
7	Cheticamp.....	8	Mrs. M. Fiset.....	100 00 " "	" 1, 1887.	
8	Pleasant Bay.....	27	Mrs. D. Smith .....	50 00 " "	Apl. 14, 1900.	
	Meat Cove .....	19	See Meat Cove Line..... } D. C. Dawson, D. Supt.. }	150 00 " "	Jan. 1, 1887.	
	<i>Repairer's Sections.</i> —					
	Mabou—Strathlorne.....		L. G. McDougall.....	40 00 per annum...	Nov. 3, 1902.	
	Strathlorne—S. W. Mar- garee .....		J. D. McFarlane.....	40 00 " "	June 4, 1902.	
	S. W. Margaree—Margaree Harbour.....		Alex. McFarlane, sr.....	40 00 " "	" " "	
	Margaree Harbour—Grand Etang.....		H. K. McLean.....	25 00 " "	" 1, 1903.	
	Grand Etang—Cheticamp.		M. Lindee.....	25 00 " "	" " "	
	Cheticamp—Barren. ....		F. Aucoin.....	40 00 " "	" " "	
	Barren—Pleasant Bay.....		J. A. McLean .....	40 00 " "	" " "	
	Pleasant Bay—Polits Cove.		K. Fraser.....	40 00 " "	" " "	
	Polits Cove -- Half way Shanty.....		E. Fraser.....	30 00 " "	" " "	
	Halfway Shanty—Meat Cove.....		R. Fraser.....	40 00 " "	" " "	
	General lineman.....		W. G. Smyth, Pt. Hood...	420 00 " "	July 1, 1903.	Salary covers horse-hire, etc.
	Totals.....	109		1,400 00		



SESSIONAL PAPER No. 19

NOVA SCOTIA TELEGRAPH SYSTEM.  
CAPE SABLE SECTION.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Barrington.....	0	.....	.....	.....	This line has been leased to the Barrington Telephone Company from August 12, 1897. The lease is terminable at any time.
2	Newellton (including 1½ knots cable).....	11	.....	.....	.....	
3	Cape Sable Island light-house (including 4 mile cable).....	6¾	.....	.....	.....	
	Totals.....	17¾	.....	.....	.....	

EAST COAST SECTION.

N. B.—In connection with the Signal Service, a land line, 208 miles in length was erected in 1881, between Canso and Halifax, for a bonus of \$16,000, and is maintained and operated by the Western Union Telegraph Company, without further cost to the Government.



GOVERNMENT TELEGRAPH SERVICE—Continued.

BAY OF FUNDY, N.B., TELEGRAPH SYSTEM.

GRAND MANAN SECTION.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per annum.	Date of Appointment.	Memo.
	<i>Long Eddy Cable Hut to</i>	Miles.		\$ cts.		
1	Flagg's Cove.....	3	Mrs. C. C. Seely (D. Supt.)	540 00	Nov. 18, 1880	*The commission is 25 p. c. on all business to and from the office in each instance; said commission guaranteed not to be less than at the rate of \$50 per annum. When 50 p. c. commission is paid there is no guarantee as to amount.
	" .....		Miss M. E. Burnham. ....	50 00 or commission	Oct. 1, 1898	
	" .....		A. Gilmour, repairer .....	60 00	Dec. 1, 1894	
2	Castalia .....	2 $\frac{1}{2}$	G. E. Dalzell.....	Commission 25 p.c. ....	June* 1, 1898	\$25 per annum is included for repeating Whitehead branch. Southern Head office is now operated by telephone from Seal Cove.
3	Woodward's Cove.....	3 $\frac{1}{2}$	W. A. Fraser.....	" 50 p.c.....	Feb. 28, 1893	
4	Grand Harbour.....	2	J. L. Newton.....	75 00 or commission	April 1, 1887	
5	Seal Cove.....	4 $\frac{1}{2}$	J. Ingersoll ..	50 00 "	Sept. 22, 1899	
6	Southern Head Lighthouse	5 $\frac{1}{2}$	O. McLaughlin .....	Commission 25 p.c. ....	April 24, 1897	
	<i>Branch Line.</i>					
7	Grand Harbour.....	0				
8	Cheney's Island ( $\frac{1}{2}$ knot cable) .....	4 $\frac{3}{4}$	W. Cheney .....	Commission 25 p.c. ....	Feb. 1, 1891	
	Whitehead (Island ( $\frac{3}{4}$ knot cable) .....	1 $\frac{1}{2}$	Mrs. W. Cassaboom .....	50 00 or commission	Feb. 1, 1903	
	Cable Long Eddy to Liberty Cove.....	7 $\frac{1}{4}$				
	<i>Liberty Cove Cable Hut to</i>					
1	Welchpool.....	7 $\frac{1}{2}$	Miss E. G. Vennell.. ....	210 00 and commission	Sept. 1, 1895	
	Cable across channel.....	1 $\frac{3}{4}$				
	Eastport, Maine U.S.A..	1 $\frac{1}{2}$	J. Cushing .....	200 00	Dec. 26, 1881	
	Totals.....	44 $\frac{1}{4}$	.. .....	1,035 00		



CHATHAM-ESCUMINAC, N.B., TELEGRAPH SYSTEM.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Chatham .....	0	Great North-western Tele- graph Co.....	185 00	.....	This amount is paid for supervision of the line and office accommodation at Chatham.
2	Black Brook.....	5½	Mrs. M. Williston.....	50 00 or commission	.....	The commission is 25 p. c. of the Government line tariff receipts in each instance, and is guaranteed to amount to not less than \$50 per annum.  per annum allowed for care of main battery at Point Escuminac.
3	Baie du Vin.....	15	Mrs. M. Brimmer.....	50 00 "	Mar. 1, 1885	
4	Lower Hardwicke.....	6	D. Lewis.....	50 00 "	Aug. 1, 1891	
5	Escuminac.....	3¾	K. R. McLennan .....	50 00 "	Sept. 1, 1885	
	Point Escuminac lighthouse	12		50 00 "	Nov. 1, 1893	
	Totals.....	42		435 00		

GROSSE ISLE QUARANTINE TELEGRAPH SYSTEM.

1	Quebec . . . . .	0	Great North-western Tele- graph Co.....	185 00 . . . . .	.....	This amount is paid for supervision of the line, and covers rent of pole line from Quebec to L'Ange Gardien, for which \$35 per annum is charged.
2	L'Ange Gardien.....	13	C. Turcott.....	50 00 or commission	Mar. 1, 1885.	This commission is 25 p. c. of the Government line tariff in each instance, and guaranteed to amount to not less than \$50 per annum.
3	Orleans Island (cable).....	4½	M. Plante.....	50 00 "	April 7, 1896.	
4	St. Pierre.....	3¼	M. Gobeil.....	120 00 and 25 p. c.	Sept. 15, 1888.	For local agency. Chief operator and repairer.
5	Ste. Pétronille.....	6½		commission.	July 1, 1888	
	St. Laurent . . . . .		P. Pouliot.....	120 00 and 25 p. c.	May 1, 1902	
6	St. Jean.. . . .	7	O. Lemelin.....	480 00 per year.....	" 15, 1900.	
7	St. François . . . . .	6¾		50 00 or commission.		
8	Isle Réaux (including 2 knots cable).....	3¼	M. D. Masson .....	100 00 and 25 p. c.	May 1, 1902.	\$4 per month for messenger serv. in summer, and \$12 p. annum allowed for care of main batt. at Gr. Isle.
	Isle Réaux (land line). . . . .	2½		commission.		
	Grosse Isle quarantine office (including 2 knots cable).	3½				
	Quarantine telephone sys- tem 2-wire line.....	1¾				NOTE.—The telephone system on Grosse Isle since May 1893, has comprised 1¼ miles of 2-wire line with 11 connections or stations.
		52¾		1,155 00		



GOVERNMENT TELEGRAPH SERVICE—Continued.  
CHICOUTIMI AND NORTH SHORE OF ST. LAWRENCE, TELEGRAPH SYSTEM.  
CHICOUTIMI SECTION.

No.	Stations.	Inter- mediate. Distance.	Agents and Operator.	Salaries per annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Bay St. Paul...	.....	F. Boivin..	180 00 per annum . { 25 p.c. commission.....*	Previous to April 1, 1885	*The commission on business is 25 per cent of the Government tolls of the line; the amount guar- anteed to be not less than \$50 per annum.
2	St. Urbain..	9 {	A. Boivin.....	50 00 or commission	" May 15, 1887	
3	La Galetta.....	37	A. Gauthier (repairer).....	210 00	Aug. 25, 1902	
4	St. Alexis ..	31½	S. Ouellette.....	100 00	Nov. 1, 1899	Plus \$25 per year for operating branch line to L'Anse St. Jean.
5	St. Alphonse de Bagotville.	3	Mrs. D. Simard. ....	50 00 or commission	April 1, 1885	Plus \$12 per annum for care of main battery.
6	Chicoutimi..	11½ {	A. Simard.....	50 00	Nov. 1, 1897	J. Fortin's division includes the branch line to L'Anse St. Jean.
7	Br. Line { St. Alexis..... St. Felix d'Otis. L'Anse St. Jean.	10 30	..... Mrs. R. Martel.....	50 00 " " or commission	June 30, 1902 Aug. 1, 1897	Plus \$12 per annum for care of main battery.
	Totals .....	132		1,110 00		



CHICOUTIMI AND NORTH OF ST. LAWRENCE TELEGRAPH SYSTEM—Continued.  
NORTH SHORE (West of Bersimis).

No	Stations.	Inter- mediate. Distance.	Agents and Operators.	Salaries per annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Murray Bay.....	0	Mrs. F. Vincent....	50 00 or commissi'n. {	Previous to April 1, 1885	
2	Cap à l'Aigle. ....	4	N. Duchesne.....	50 00 "	June 1, 1888	
3	St. Fidèle.....	6	A. N. Parent.....	50 00 "	April 1, 1890	
4	Port au Persil.....	7	{ A. Brassard.....	50 00 "	May 1, 1889	
5	St. Siméon.....	4	{ A. Brassard (repairer)....	210 00 "	June 1, 1897	
6	Baie des Rochers .....	12	D. Gaudin.....	50 00 "	Dec. 1, 1887	
7	St. Catharines Bay } Br. L.	17	G. Savard.....	50 00 "	June 1, 1887	
8	St. Etienne.. .....	13	{ G. Bouillenne.....	100 00 "	Nov. 1, 1886	Mr. Bouillenne at River Canard (St. Catharine) Bay)
9	Tadousac (14 knot cable)....	13	{ E. Bouillenne (repairer)...	210 00 "	Sept. 1, 1899	has acted as repeating operator for the St.
10	Sacré Cœur.....	12½	J. E. Caron.....	50 00 "	Nov. 1, 1888	Etienne branch since August, 1899.
11	Br. from Tadousac.....	15	L. Maltais.....	50 00 "	Dec. 6, 1901	
12	Bergeronnes .....	12	M. Savard .....	50 00 "	April 1, 1885	
13	Escoumains.....	8	J. H. Topping .....	50 00 "	" 1, 1885	
14	Baie des Bacons.....	8	P. Bouchard.....	50 00 or comm'n.....	May 6, 1892	Commission, at 25 per cent, without guarantee at
15	Mille Vaches.....	11½	J. A. Puise. ....	50 00 or comm'n.....	April 1, 1885	Baie des Bacons.
16	Hamilton Cove. ....	6	C. P. Easton.. ..	50 00 or comm'n.....	Sept. 1, 1903	Accommodation office.
17	Portneuf light .....	7	{ S. Bouchard.....	50 00 or comm'n.....	July 1, 1890	
18	Sault au Cochon .....	31	{ E. Courbron (repairer)...	420 00.....	April 1, 1888	
	Bersimis. ....		{ Mrs. A. Laurier, agt & opr	500 00 .....	Jan. 1, 1902	Sault au Cochon closed September 30, 1896.
			{ ..... asst. opr.	180 00.....		
			E. Pope, dist. supt.....	600 00.....	April 1, 1885	
	*Totals. ....	174		2,870 00		

\*NOTE.—In the estimates the maintenance of the Chicoutimi and North Shore line is provided under head of North Shore Line. They are operated conjointly.



GOVERNMENT TELEGRAPH SERVICE—Continued.  
CHICOUTIMI AND NORTH OF ST. LAWRENCE TELEGRAPH SYSTEM—Continued. NORTH SHORE (East of Bersimis).

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts. 50 00 or commission*	Dec. 1, 1896	
1	P'te aux Outardes (cable).. <i>P'te Paradis</i> (Manicouagan) cable landing. ....	12	H. Tremblay. ....			
2	Scougalls Mills 14 mile loop line from P'te. Paradis. .	18				
3	River Godbout (cable)....	28	Accommodation office. ....	25 p.c. commission .....	Aug. — 1901	
4	Pointe des Monts.....	26	N. A. Comeau .....	50 00 or commission	Oct. 15, 1885	
5	Trinity Bay West.....	18½	L. F. Faffard. . . . .	50 00 "	Dec. 28, 1883	
6	Trinity Bay East. ....	51	Z. Poulin.....	50 00 "	May 16, 1884	
7	Caribou Islands.....	2½	A. Bilodeau .....	25 p.c. commission .....	" 1, 1889	
8	Pointe aux Anglais.....	7	L. Comeau .....	" .....	Sept. 1, 1889	
9	Pentecost River.....	10½	Paul Côté .....	Accommodation office....	Jan. 10, 1895	No commission is paid at this office.
10	Ste. Marguerite.....	6½	E. H. Tétu, D. Supt. ....	1,080 00 per annum.....	Nov. 1, 1891	
11	Clark City.....	47½	A. Therriault.....	180 00 "	July 1, 1888	
12	Seven Islands.....	5	Accommodation office. ....	25 p.c. commission .....	April 17, 1903	
13	River Moisie.....	17¾	(P. E. Vignault, opr. ....	180 00 per annum....	Jan. 2, 1884	
14	Little River .....	15½	(L. N. Caron.....	540 00 "	May 29, 1902	Plus 50 cents per day when absent on duty.
15	Sheldrake .....	57	J. Poirier. ....	50 00 or commission.	June 1, 1896	
16	Thunder River .....	15	Miss H. Leberge.....	50 00 "	Oct. 10, 1900	
17	Magpie.....	6½	A. LeBerge.....	50 00 "	" 1, 1897	
18	St. John's River .....	14	Mrs. H. Cody .....	50 00 "	Feb. 1, 1890	
19	Long Point.....	9	Geo. Molloy.....	50 00 "	Oct. 1, 1889	
20	Mingan.....	10	B. Chambers.....	50 00 "	" 1, 1889	
21	Point Esquimaux.....	7	A. Maloney.....	360 00 .....	Sept. 21, 1896	Long Point is the repeating office for the Anticosti cable in operation since September 1, 1891.
22	Betchouanes .....	24	M. J. Maloney.. ..	50 00 or commission.	Oct. 1, 1889	Allowance for office rent \$4, per month.
23	Piastre Bay.....	20	(Mrs. D. C. Hould.....	240 00 per annum .....	Sept. 2, 1902	Plus 50 cents per day when absent on duty.
24	Watichou .....	23	(Edwd. Cyr, inspr. ....	" .....	Nov. 1, 1902	
25	Aguanus.....	15	(Alfd. Bodreau, repr.....	112 00 "	Sept. 1, 1902	
26	Natashquan .....	21½	(Mrs. A. Boudreau, opr..	100 00 "	" 1, 1902	
27	Kegaska.....	33	(S. Tanguay, repr.....	112 00 "	" 18, 1902	
28	Masquaro.....	18	(Mrs. J. Beetz, opr. ....	100 00 "	" 18, 1902	
			(J. Saltman, repr .....	112 00 "	Nov. 1, 1902	
			(Mrs. Saltman, opr.....	100 00 "	" 1, 1902	
			(S. Galant, repr.....	112 00 "	Sept. 3, 1902	
			(Mrs. Galant, opr. ....	100 00 "	" 3, 1902	
			(C. Vignault, repr.....	112 00 "	" 5, 1902	
			(Miss Vignault, opr.....	100 00 "	" 5, 1902	
			(Geo. Anderson, repr....	112 00 "	" 16, 1902	
			(Miss Anderson, opr.....	100 00 "	" 16, 1902	
			(J. W. Osborne, inspr....	500 00 "	" 1, 1902	Plus 50 cents per day when absent on duty.
			Wm. Foreman, opr & repr..	212 00 "	June 1, 1903	



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29	Romaine. ....	25	{ M. Blais, repr. ....	112 00	per annum	....	Sept.	17, 1902
30	Wolf Bay. ....	24	{ Miss R. Blais, opr. ....	100 00	"	....	"	17, 1902
31	Pt. au Maurier. ....	24	{ R. Jones, repr. ....	112 00	"	....	Nov.	26, 1902
32	Harrington. ....	20	{ Miss R. Jones, opr. ....	100 00	"	....	"	26, 1902
33	Whale Head ...	17	{ J. Galibois, repr. ....	112 00	"	....	Sept.	19, 1902
34	Mutton Bay. ....	20	{ Miss P. Galibois, opr. ....	100 00	"	....	"	19, 1902
35	Bay de Ha. ....	27	{ J. Jones, repr. . . . .	112 00	"	....	"	20, 1902
36	St. Augustine. ....	27	{ Mrs. Jones, opr. ....	100 00	"	....	"	20, 1902
37	Coxipl. ....	24	Nap. Nadeau, repr & opr.	212 00	"	....	Jan.	21, 1903
38	Rockey Bay. ....	30	Alf. Cormier, repr & opr ..	444 00	"	....	June	1, 1902
39	St. Paul River. ....	21	.....	.....	.....	.....	.....	.....
40	Brador Bay.. ...	29	G. W. Bargess, repr & opr.	212 00	per annum	....	Sept.	25, 1902
41	Blanc Sablon. . . .	6	Jos. Picard, repr & opr. ....	212 00	"	....	Dec.	16, 1902
42	Forteau Bay. ....	13	W. Kennedy, repr & opr ..	212 00	"	....	Sept.	27, 1902
43	Pointe Amour . . . .	7	{ G. Chevalier, repr. ....	112 00	"	....	Oct.	2, 1902
44	Western Modiste. ....	16	{ Miss Chevalier, opr. ....	100 00	"	....	"	2, 1902
45	Red Bay . . . . .	18	{ Johnny Jones, opr. ....	100 00	"	....	June	13, 1903
46	Chateau Bay. ....	30	{ P. C. Vignault, inspr. . .	500 00	"	....	Feb.	1, 1903
47	Belle Isle. ....	23 <sup>3</sup> / <sub>4</sub>	Thos. Morel, repr & opr. ....	212 00	"	....	Oct.	1, 1902
			A. Hart, repr & opr. ....	212 00	"	....	July	19, 1902
			Thos. Whyat, repr & opr. ....	112 00	"	....	Feb.	17, 1903
			Jas. Bolger, repr & opr. ....	212 00	"	....	Oct.	5, 1902
			{ Geo. Moore, repr. ....	112 00	"	....	"	9, 1902
			{ Miss Moore, opr. ....	100 00	"	....	"	9, 1902
			{ Jos. Maloney, opr & inspr	500 00	"	....	Sept.	1, 1902
			{ Miss Buckel, asst opr. ....	180 00	"	....	Dec.	1, 1902
			J. C. Colton, opr. ....	360 00	"	....	Sept.	14, 1901
	Totals. ....	916		10,566 00				

Not yet opened.

Plus 50 cents per day when absent on duty.



GOVERNMENT TELEGRAPH SERVICE—Continued.

ONTARIO—PELEE ISLAND TELEGRAPH SERVICE.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Leamington.....	.....	J. McR. Selkirk, D. Supt..	50 00.....	Nov. 1, 1888	
2	Leamington Dock... ..	2	F. Deslauriers .....	Accommodation office....	" 1, 1895	
3	Club House.....	5	C. Harrison .....	Commission 25 p. c.....	April 1, 1889	The commission is on the tolls for the Government line.
4	Point Pelee.....	5	W. A. Grubb .....	"	Nov. 1, 1888	
	Leamington Dock to North Point Cable .....	17	.....	.....	.....	
5	North Point Lighthouse...	1	J. R. Ledwell .....	Commission 25 p. c.....	June 1, 1899	The cable formerly 9½ knots from Point Pelee to the Island is now laid as here indicated 17 knots. The change was effected in August, 1901.
6	North Dock.....	2	C. B. Quick.....	"	Nov. 1, 1888	
7	McIntyre's Corner.....	2½	Mrs. A. McIntyre.....	"	" 1, 1896	
8	West Dock.... ..	2½	A. M. McCormick.....	"	" 9, 1888	
9	South Dock.....	5½	T. W. Ferguson.....	"	July 1, 1900	
	Totals.....	42½		50 00		

NOTE.—This line is operated with telephones.



LINES IN THE NORTH-WEST TERRITORIES.

No.	Stations.	Int- mediate Distance.	Agents.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Qu'Appelle-Edmonton Section.</i>	Miles.		\$ cts.		
1	Qu'Appelle.....	0 {	J. S. Macdonald, D. Supt....	1,200 00	Jan. 1, 1898	The agent-operator at Qu'Appelle is joint with the C.P.R.
2	Fort Qu'Appelle.....		C. P. R. Tel. Co.....	420 00	Dec. 1, 1896	
3	Touchwood.....		J. W. Wilson, lineman ..	360 00	Mar. 1, 1902	
	Humbolt.....		Miss E. Johnston ..	600 00	March 1, 1885	
		46	A. VonLindeburg.....	600 00	Nov. 1, 1883	Humboldt office was closed August 20, 1893. The agent-operator at Saskatoon is joint with the C.P.R.
4	Saskatoon (14 miles loop)	78	.....	.....	.....	
5	Henrietta.....	69 {	C. P. R. Tel. Co.....	300 00	Jan. 1, 1892	
6	Battleford.....	52	J. Harrington, repairer....	600 00	" 1, 1888	
7	Bresaylor.....	47 {	W. Salsbury.....	720 00	Oct. 1, 1886	Closed since October, 1898. Lineman thereafter stationed at Union Lake.
8	Pitt.....	27	L. P. O. Noel.....	720 00	April 15, 1890	
9	Onion Lake.....	62	J. T Callahan, lineman ..	720 00	Dec. 1, 1900	
10	Moose .....	13	D. Noel.....	720 00	Oct. 1, 1900	
11	St. Paul de Metis..	32½	.....	.....	.....	A telephone line extends from the office at Saddle Lake to the Industrial School, 6½ miles.
12	Saddle Lake ..	32	H. McCleneghan.....	600 00	Oct. 1, 1900	
13	Victoria.....	37	G. G. Mann ..	600 00	Aug. 1, 1902	
14	Star.....	6	M. Therien..	360 00	Dec. 1, 1899	
15	Ft. Saskatchewan.	43	J. W. Carroll.....	600 00	Sept. 1, 1900	The office at Edmonton has been operated jointly with the C.P.R. Tel. Co. since Jan. 1, 1892.
	Edmonton.....	24 {	J. C. Gordon.....	600 00	April 1, 1899	
			V. Gauvreau.....	600 00	Mar. 15, 1902	
			A. W. M. Campbell.....	600 00	Oct. 1, 1898	
			T. J. McNamara .....	360 00	Oct. 1, 1901	This branch line is operated by the Edmonton District Telephone Co.
			W. McKay, lineman .....	720 00	May 1, 1886	
	<i>Branch Line.</i>	598½		12,000 00		
16	Edmonton.....	0 {				
17	St. Albert.....	9 }	In operation prior to 1895.....			
18	River Qui Barre.....	21 {	This section built in 1903.....			
	Alexandria.....	6 }				
		36				



GOVERNMENT TELEGRAPH SERVICE—Continued.  
LINES IN THE NORTH-WEST TERRITORIES.

No.	Stations.	Inter- mediate Distance.	Agents.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Wood Mountain Section</i>	<i>Miles.</i>		<i>\$ cts.</i>		
1	Moosejaw. . . . .	0	C.P. Tel., agent. . . . . H. Sikes, repairer. . . . .	240 00 600 00	Dec. 1, 1891 " 1, 1893	Moosejaw office is operated jointly with the Canadian Pacific Telegraph Co.
2	Wood Mountain. . . . .	90½	J. H. Thompson, agent. . . . .	360 00	" 1, 1890	
	<i>Duck Lake Section.</i>	<i>90½</i>		<i>1,140 00</i>		
1	Batoche. . . . .	0	D. H. Grant . . . . .	120 00	Oct. 1, 1902	Telephone connection.
2	Duck Lake . . . . .	9	A. H. Gordon. . . . .	120 00	Feb. 1, 1903	
3	Indian Agency. . . . .	3½	. . . . .	. . . . .	. . . . .	
		<i>12½</i>		<i>\$240 00</i>		

BRITISH COLUMBIA.

	<i>Victoria—Cape Beale.</i>		(See note in margin). . . . .	. . . . .	. . . . .	NOTE.—The superintendence of this line has been in the hands of the resident engineer at Victoria since October, 1901, when the arrangement theretofore in operation with the C. P. Ry. Co. was terminated. Proportion of salary.
1	Victoria. . . . .	0	E. Houghton, oper. (C.P.Tel)	200 00	Nov. 1, 1891.	
2	Sooke. . . . .	18	. . . . .	. . . . .	. . . . .	
3	Otter Point. . . . .	8	E. Gordon, agt. and operator.	720 00	Dec. 1, 1891.	
4	Jordan River (San Juan). . . . .	10	J. Goodie, " . . . . .	540 00	May 1, 1897.	
5	Port San Juan (Port Renfrew) Carmanah Lighthouse. . . . . (Clo-oose 2 miles west). . . . .	30 24	B. H. Kirkpatrick, " . . . . . W. P. Daykin, " . . . . . D. Logan, repairer. . . . .	720 00 240 00 540 00	July 1, 1900. Nov. 1, 1891. April 1, 1898.	
6	Cape Beale. . . . .	28	Otto Rosander, repairer. . . . . M. Patterson, agt. and oper'r.	540 00 120 00	March 6, 1901. Sept. 1, 1899.	
	Total. . . . .	118		3,660 00		



SESSIONAL PAPER No. 19

BRITISH COLUMBIA—Continued.

No.	Offices.	Inter- mediate Distance.	Agents, &c.	Positions.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Kamloops—Lower Nicola.</i>	Miles.	(See note in margin)		\$ cts.		
	Telephone Line.						
1	Kamloops.....	0	A. J. Venn (C. P. Tel.).....	Agent.....	300 00	April 18, 1900.	NOTE.—This line is operated under the superintendence of the resident engineer at Victoria.
2	Anderson Creek .....	12	Prov. Govt. Office. ....	Lessee..		Connected.	
3	Nicola Valley .....		W. McLeod .....	"		July 1901.....	NOTE.—The lessees pay a monthly rent for the connections, and are allowed 25 per cent commission on local tolls for messages and conversations of non-subscribers.
4	Stumps Lake .....	13	W. R. McDonald.....	"		"	
5	Beaver Ranch..		Thos Bullman.....	"		"	Three additional connections in July 1901.
6	Outchena.....	20	J. W. Moor.....	"		May 1900 .....	
7	Nicola Lake ....	9	A. E. House.....	"		" 1901 .....	
8	Coutlee ..		E. O'Rourke.....	"		July 1901 ..	
9	Lower Nicola..	13	Blair & Co.....	"		May 1900 ...	
			G. Armstrong....	"			
	Total.....	67					



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## GOVERNMENT TELEGRAPH SERVICE—Continued.

## BRITISH COLUMBIA—Continued.

No.	Offices.	Inter- mediate Distance.	Agents, &c.	Positions.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Nanaimo-Comox.</i>	Miles.			\$ cts.		
1	Nanaimo.....	0	{ W.F. Archibald. A. M. Oliver, joint with C.P.R.	Agent and operator....	306 00	Mar. 1, 1896	The amount comprises \$20 per month for agency and operation, \$3 for messenger service and \$2.50 for battery care.
2	Wellington.....	5	{ E. & N. Ry. Co... Mrs. R. Williams	Assistant operator.... Agent and operator....	120 00 Commission.....	June 1, 1902 April 1, 1893	
3	Parksville.. . . .	23	{ W. Mills..... Miss. E. McDo- nald.....	" .. Lineman .....	360 00 360 00	Dec. 1, 1897 June 1, 1903	Parksville, Quelicum section.
4	Union Bay.....	32½	{ Thos. Hudson... J. Dunsmuir.....	Agent and operator.... Lineman.....	360 00 780 00	June 3, 1898 Nov. 17, 1898	
5	Union Mines.....	.....		Accommodation office..	.....	.....	See mention of this in body of report (1897-98)
6	Cumberland.....	10	Albert Peacy....	Agent and operator....	and com. 25 p. c.	April 28, 1898	
7	Courtney . . . . .	7	.....	.....	.....	.....	Courtney and Comox communicated by telephone at pre- arranged intervals.
8	Comox . . . . .	3½	M. McDonald....	Agent and operator....	360 00	Nov. 1, 1895	
	Total.....	81			2,766 00		NOTE.—The repairs of this line has been done jointly with the Can. Pac. Telegraph since December 1, 1902.
	<i>Parkerville, Alberni and Cape Beale line.</i>						
	Parksville.....	0	(See above).....				
1	Alberni.....	29½	Mrs. P. A. Haslam	Agent and operator....	240 00	Oct. 1, 1899	Proportion of salary for Comox line included.
2	Cape Beale . . . .	57	M. Patterson.....	" ..	240 00	May 1, 1900	Proportion of salary for this line.
		86½			480 00		



## SESSIONAL PAPER No. 19

## BRITISH COLUMBIA—Continued.

No.	Office.	Inter- mediate Distance.	Agents, &c.	Positions.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Alberni-Clayoquot Line.</i>	Miles.			\$ cts.		
1	Alberni. ....	0	P. A. Haslam. ....	Agent and operator. ....	120 00	Dec. 1, 1902	Proportion for this line.
2	New Alberni. ....	2	E. B. Gerrard. ....	Agent lineman. ....	660 00	" 1, 1902	Line crosses canal at this point by submarine cable.
	<i>Franklin Creek. ...</i>	8					
	$\frac{1}{2}$ mile cable.	20 $\frac{1}{2}$	{ W. L. Thompson	Agent lineman. ....	720 00	Dec. 1, 1902	
3	Uchuelet. ....		{ H. J. Hillier. ....	Lineman. ....	660 00	" 1, 1902	
4	Clayoquot. ....	66 $\frac{1}{4}$	E. S. Reeve. ....	Agent lineman. ....	720 00	" 1, 1902	
	Stubbs Island. ....		.....	Accommodation office.	.....	.....	Private cable connection for local firm.
	Total. ....	96 $\frac{3}{4}$			2,880 00		
	<i>Golden, Windermere line.</i>						
1	Golden. ....	0	C. E. Wells. ....	Agent and operator. ....	300 00	Mar. 1, 1902	Joint agent with C. P. Tel.
2	Windermere. ....	82	{ V. F. Dunn. ....	Agent. ....	720 00	Jan. 1, 1902	Local superintendency.
3	Atholmer. ....	*5	{ T. W. Kimpton. ....	Lineman. ....	900 00	May 1, 1902	Salary covers horsehire, &c.
4	Wilmer. ....	5	Teleph. connection	.....	.....	.....	Operated from Windermere and Wilmer.
			R. A. Power. ....	.....	600 00	Jan. 1, 1902	
	Total. ....	92			2,520 00		

\* This 5 miles runs back on the pole line from Windermere.



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## GOVERNMENT TELEGRAPH SERVICE.

## YUKON LINES.

NAMES of employees and monthly salaries, Yukon Telegraph Service, which includes Port Simpson-Hazelton, Lillooet and Horse Fly Branches.

(As submitted in a report bearing date December 19, 1902).

Name.	Capacity.	Where Employed.	Amount.	Remarks.
			\$ cts.	
G. E. Gooding	Manager	Ashcroft*	61 20	} Joint employees with C.P.R., 80 p.c. of which is paid by Yukon telegraphs.
F. C. Schanz	Operator	"	42 00	
E. L. Coombs	"	"	42 00	
S. Pritchard	Lineman	"	75 00	} Horsefly Branch.
P. R. Quain	Clerk	"	83 33	
S. A. Macfarlane	Oper. & Lineman	Lillooet	60 00	
A. LeBourdais	"	Clinton	60 00	
S. Hannah	"	115 Mile House	60 00	
S. T. Hall	"	115 "	60 00	
S. Patenaude	"	Harper's Camp.	40 00	
O. Landry	"	Quesnelle Forks	66 66	
C. H. Smith	"	Soda Creek	60 00	
A. Bowron	Operator	Quesnelle	60 00	
O. Earley	Lineman	"	60 00	
Geo. E. Broughton	Oper. & Lineman	Alexandria	60 00	
James Stone	"	Baskerville	60 00	
J. H. Waller	Operator	Blackwater	75 00	
C. E. MacMaster	Lineman	"	70 00	
W. T. Broderick	Operator	Bob Tail Lake	75 00	
A. McDonald	Lineman	"	70 00	
W. F. Manson	Operator	Stoney Creek	75 00	
J. McNeil	Lineman	"	70 00	
G. W. Proctor	Operator	Fraser Lake	75 00	
J. W. Howison	Lineman	"	70 00	
W. Heinz	Operator	Burns Lake	75 00	
B. Laskbrook	Lineman	"	70 00	
J. R. Cameron	"	South Buckley	70 00	
James A. McKay	"	"	70 00	
A. McInnis	"	North Buckley	70 00	
N. McInnis	"	"	70 00	
L. Broughton	"	Buckley Branch	70 00	
H. Fink	"	"	70 00	
T. F. Cowan	Operator	Morricetown	75 00	
T. Gagné	Lineman	"	70 00	
G. M. Swan	Operator	Hazelton	100 00	
E. R. Cox	"	"	100 00	
J. C. K. Sealy	Lineman	"	75 00	
E. E. Charleson	Line F'man & storekeeper	"	150 00	
J. D. Charleson	Asst. storekeeper	"	75 00	
H. A. Cullen	Operator	1st Cabin	75 00	
G. T. Brown	"	Kuldo	75 00	
G. T. Carpenter	Lineman	"	70 00	
Chas. Martin	Operator	3rd Cabin	75 00	
H. P. Travis	"	4th "	75 00	
J. McMenamin	Lineman	4th "	70 00	
E. A. Hawley	Operator	5th "	100 00	
C. Loucks	Lineman	5th "	90 00	
J. Muir	Operator	6th "	100 00	
W. Ross	Lineman	6th "	90 00	
J. D. McIntosh	Operator	7th "	100 00	
Geo. Smith	Lineman	7th "	90 00	
J. Mooney	Operator	8th "	100 00	
G. Duhamel	Lineman	8th "	90 00	
J. Wiggins	Operator	9th "	100 00	
G. Hill	Lineman	9th "	90 00	
J. Berlinguet	Operator	Echo Lake	100 00	
H. Moore	Lineman	"	90 00	
R. Barton	Operator	25 Mile Cabin	100 00	
J. W. Hovey	Lineman	25 "	90 00	
J. A. Watts	Operator	Iskoot	100 00	
W. Warnock	Lineman	"	90 00	
W. T. Patterson	"	Sheep Creek	75 00	
F. N. Jackson	"	"	75 00	



## SESSIONAL PAPER No. 19

NAMES of employees and monthly salaries Yukon Telegraph Service, which includes  
Port Simpson-Hazelton, Lillooet and Horse Fly Branches.

(As submitted in a report bearing date December 19, 1902).

Name.	Capacity.	Where Employed.	Amount.	Remarks.
			\$ cts.	
A. B. Taylor....	Operator .....	Telegraph Creek....	100 00	
A. Johnson.....	Lineman .....	" .....	75 00	
A. J. Charleson.....	Line f'man & storekeeper	" .....	150 00	
A. Daoust.....	Operator .....	Shesley.....	82 50	
James Craig.....	Lineman .....	" .....	75 00	
A. S. Gillespie.....	Operator .....	Nahlin.....	82 50	
James Murie .....	Lineman .....	" .....	75 00	
R. P. Hall.....	Operator .....	Nakina.....	82 50	
Douglas Potts.....	Lineman .....	" .....	75 00	
J. A. Goodfellow.....	Operator .....	Pike River.....	82 50	
J. Huston.....	Lineman .....	" .....	75 00	
<i>Port Simpson Branch.</i>				
E. Tomlinson.....	Operator .....	Meanshinisht.....	50 00	
R. Tomlinson.....	Lineman .....	" .....	75 00	
H. N. Boss.....	Operator .....	Skeena Canyon.....	75 00	
G. M. Davis.....	Lineman .....	" .....	70 00	
W. Clark.....	Operator .....	Telegraph Point.....	75 00	
C Peterson.....	Lineman .....	" .....	70 00	
Gus. Coutu.....	Operator .....	Aberdeen... ..	75 00	
M. W. O'Neil.....	" .....	Port Simpson. ....	50 00	
Guy Lawrence.....	Lineman .....	Atlin.....	75 00	
E. H. Goodfellow.....	Operator .....	" .....	100 00	
J. Stronach.....	" .....	Centre Cabin.....	82 50	
F. W. Dowling.....	Circuit Mangr.....	Atlin.....	116 66	
S. E. Chambers.. ..	Operator .....	Caribou Crossing....	82 50	
M. R. Grimes.....	" .....	Tagish.....	82 50	
H. J. Macdonald.....	Lineman .....	" .....	75 00	
A. B. Clegg.....	Dist. Supt.....	White Horse.....	175 00	
H. Gilchen.....	Storekeeper.....	" .....	150 00	
J. P. Champagne.. ..	Clerk.....	" .....	112 00	
G. S. Fleming.....	Agent .....	" .....	115 00	
G. J. Marshall.....	Lineman .....	" .....	75 00	
H. Shadwell.....	Messenger.....	" .....	25 00	
Mrs. Jeffries... ..	Cook & housekeeper.....	" .....	75 00	
J. Hope.....	Operator .....	Lower Leberge.....	82 50	
J. H. Brown .....	Lineman .....	" .....	75 00	
W. Vinet .....	Operator .....	Hootalinqua.....	82 50	
J. W. Graham .....	" .....	Big Salmon.....	82 50	
H. Lokken.....	Lineman .....	" .....	75 00	
W. S. Lanktree .....	Operator .....	Five Fingers.. ..	82 50	
C. M. Lanktree.....	Lineman .....	" .....	75 00	
G. A. MacLachlin.....	Operator .....	Fork Selkirk.....	82 50	
K. Smith.....	Lineman .....	" .....	75 00	
W. Peter.....	Operator .....	Selwyn.....	82 50	
W. Wridgeway.....	Lineman .....	" .....	75 00	
G. Aymore.....	Operator .....	Stewart River .....	82 50	
J. P. Beausoleil .....	" .....	Ogilvie.....	82 50	
R. Echlin.....	Lineman .....	" .....	75 00	
F. Brownlow.....	Manager.....	Dawson.....	150 00	
F. Hanley.....	Operator .....	" .....	125 00	
C. Couture.....	Foreman.....	" .....	125 00	
D. S. MacKenzie.....	Operator .....	" .....	125 00	
R. C. MacDonald.....	Clerk.....	" .....	100 00	
Mrs. D. Hunt.....	Cook & housekeeper.....	" .....	100 00	
A. Cloes .....	Messenger.....	" .....	93 00	
A. Meloche.....	Lineman .....	" .....	80 00	
W. L. McCracken.....	Operator .....	Forty Mile.....	82 50	
W. W. Boyd.....	Lineman .....	" .....	75 00	
M. W. Crean.....	Superintendent.....	Vancouver.....	208 16	
J. J. Healy.....	Clerk.....	" .....	140 00	
F. D. Abbott.....	Stenographer .....	" .....	65 00	
J. T. Phelan .....	Dist. Sup't .....	Ashcroft.....	175 00	
			10,440 01	

\* \$85 per month. † \$70 per month. ‡ \$70 per month.

A table of distances between Offices and Testing Stations will be found at the end of the appended tariff sheets.



GOVERNMENT TELEGRAPH LINES.

SPECIAL TARIFF.

*Cable messages.*—Rates for cable messages passing over the Yukon line will be found in connection with the Yukon tariff in the following pages.

Elsewhere, the rate for transatlantic messages passing over the government lines is the same as for ordinary through messages, excepting where the ordinary tariff is more than 25 cents; in such cases the government line rate is 4 cents per word, with a minimum charge of 25 cents. For example :—

For a message of six words or less the charge is 25 cents for government line.

For a message of seven words the charge is (7 x 4) 28 cents for government line.

For a message of twelve words the charge is (12 x 4) 48 cents for government line.

In every case the counting of words includes the address and signature in the same way as for transatlantic cable tolls.

*Press despatches.*—The rate for press despatches on the government lines (excepting the Yukon line), is 20 cents per 100 words; no single message less than 20 cents.

For the *Yukon* line the rate is 1 cent per word, minimum charge \$1; this applies to the whole line.

REGULAR TARIFF.

NOVA SCOTIA.

Line from North Sydney to Meat Cove and Mabou—Local rate 25-1\* (20 offices).

Big Bras d'Or... ..	Through rate	15-1	from	North Sydney,	W. U. office.
New Campbellton's (Kelly's	"	"	"	"	"
Cove).....	"	"	"	"	"
Englishtown.....	"	"	"	"	"
Baddeck.....	"	"	"	"	"
Murray.....	"	"	"	"	"
Indian Brook.....	"	"	"	"	"
French River.....	"	"	"	"	"
South Ingonish.....	"	"	"	"	"
Ingonish.....	"	"	"	"	"
Neil's Harbour.....	"	"	"	"	"
Dingwall.....	"	"	"	"	"
Aspy Bay.....	"	"	"	"	"
Meat Cove.....	"	"	"	"	"
Pleasant Bay.....	"	"	"	"	"
Cheticamp.....	"	"	"	"	"
Grand Etang.....	"	"	"	"	"
North-East Margaree.....	"	"	"	"	"
Margaree Harbour.....	"	"	"	"	"
South-West Margaree.....	"	"	"	"	"
Broad Cove.....	"	"	"	"	"

*Night messages* are exchanged with the Western Union Telegraph Company for offices on this line. Rate 1 cent per word with minimum of 15 cents. The local night rate is 1 cent per word with minimum of 25 cents.

\* When the tariff rate is entered as 25-1 or 50-2, &c., the meaning is that the rate is 25 cents or 50 cents for ten words and 1 cent or 2 cents for each additional word.



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*Line from Barrington to Cape Sable—Local rate 12-1.*

Newellton... Through rate 12-1 from Barrington, W. U. office  
 Cape Sable Lighthouse... " " "

This line is now operated by the local telephone company. Terms of lease provide for former telegraph rate as above not being exceeded.

## NEW BRUNSWICK.

*Line from Chatham to Point Escuminac—Local rate 25-1 (4 offices).*

Bay du Vin... Through rate 15-1 from Chatham, G. N. W. office.  
 Lower Hardwicke... " " "  
 Escuminac... " " "  
 Pt. Escuminac Lt. House.... " " "

*Line from Eastport, Me., to Campobello, Grand Manan, and Whitehead Islands (9 offices)—Local rates between offices on Grand Manan, and Whitehead Islands 15-1; Grand Manan and Campobello Island 25-2; The Islands and Eastport, Me., 25-2, W.U.O.*

Welchpool, Campobello..... Through rate 25-2 from Eastport, Me., W. U. office.  
 Flagg's Cove, Grand Manan.. " " "  
 Castalia... " " "  
 Woodward's Cove... " " "  
 Grand Harbour... " " "  
 Seal Cove... " " "  
 Southern Head... " " "  
 Cheney's Head... " " "  
 Whitehead Islands... " " "

## QUEBEC.

*Line from Gaspé to Anticosti Island, Q. (9 offices)—Local rates between offices on the Island 25-1; Gaspé and the Island offices 50-2.*

South-West Point... Through rate 50-2 from Gaspé, G. N. W. office.  
 Salt Lake... " " "  
 Shallop Creek... " " "  
 South Point... " " "  
 Heath Point... " " "  
 Fox Bay... " " "  
 Becscie River... " " "  
 West Point... " " "  
 English Bay... " " "

*Line from Meat Cove, C.B., N.S., to Magdalen Islands, Q. (9 offices)—Local rates between offices on the Islands 25-1; Meat Cove and the Islands 50-2; offices on the Meat Cove line and the Islands 50-2.*

Amherst Island... Through rate 50-2 from North Sydney, W. U. office.  
 Amherst Lt. House... " " "  
 Etang du Nord Village... " " "  
 Etang du Nord Lt. House... " " "  
 Cap aux Meules (Grindstone). " " "  
 House Harbour... " " "  
 Grosse Isle... " " "  
 Grand Entry... " " "  
 Bryon Island... " " "



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*Line from Meat Cove, C.B., N.S., to St. Paul's Island—Local rate between offices on Meat Cove line and St. Paul's 50-2 (1 office).*

St. Paul's Island Lt. House 50-2 from North Sydney, N.S., W. U. office.

*Line from Quebec to Grosse Isle Quarantine Station (7 offices)—Local rates between offices on Orleans Island and Isle Réaux 15-1; on Orleans Island, Isle Réaux and Quebec 15-1; on Orleans Island and Grosse Isle 25-1; on Isle Réaux and Grosse Isle 15-1.*

St. Pierre, Orléans Island..	Through rate 15-1 from Quebec, G. N. W. office.
Ste. Pétronille.. . . . .	" " "
St. Laurent.. . . . .	" " "
St. Jean.. . . . .	" " "
St. François.. . . . .	" " "
Isle Réaux.. . . . .	" " "
Grosse Isle.. . . . .	" 25-1 " "

*Line from Baie St. Paul to Chicoutimi (7 offices).*

For business with offices west of Baie St. Paul and terminating at Quebec, add 15c. and 1c. to the government line tariff.

For business with offices west of Baie St. Paul, beyond Quebec, add the full rate of the Great North-Western Telegraph Company to the government line tariff.

*Line from Murray Bay to Chateau Bay (48 offices) with branch to Anticosti and extension to Belle Isle.*

For business with offices west of Murray Bay and terminating at Quebec, add 15c. and 1c. to the government line tariff.

For business with offices west of Murray Bay, beyond Quebec, add the full rate of the Great North-Western Telegraph Company to the government line tariff.

*Local rates between offices not more than 100 miles apart 15-1; more than 100 miles apart 25-1; on mainland and Anticosti 50-2; and on mainland and Belle Isle 50-2.*

St. Urbain.. . . . .	15-1 from Baie St. Paul (Ck. Que.) G. N. W. office.
Lacruche.. . . . .	" " "
St. Alexis.. . . . .	" " "
L'Anse St. Jean.. . . . .	" " "
St. Alphonse de Bagotville.	" " "
Chicoutimi.. . . . .	" " "
Cap à l'Aigle.. . . . .	15-1 from Murray Bay (Ck. Que.) G. N. W. office.
Ste. Fidèle.. . . . .	" " "
Port au Persil.. . . . .	" " "
St. Siméon.. . . . .	" " "
Baie des Rochers.. . . . .	" " "
Rivière aux Canards....	" " "
St. Etienne.. . . . .	" " "
Tadoussac.. . . . .	" " "
Bergeronnes.. . . . .	" " "
Escoumains.. . . . .	" " "
Baie des Bacons.. . . . .	" " "
Mille Vaches.. . . . .	25-1 " " "
Portneuf Mills.. . . . .	" " "
Portneuf Light.. . . . .	" " "
Sault au Cochon.. . . . .	" " "
Betsiamis (Bersimis)...	" " "



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Manicouagan (Pt. Outardes). 25-1 from Murray Bay (Ck. Que.) G. N. W. office.			
Scougall's Mills.. . . . .	"	"	"
River Godbout.. . . . .	"	"	"
Pointe des Monts.. . . . .	"	"	"
Trinity Bay, West.. . . . .	"	"	"
Trinity Bay, East.. . . . .	"	"	"
Caribou Islands.. . . . .	"	"	"
English Point.. . . . .	"	"	"
Pentecost.. . . . .	"	"	"
Ste. Marguerite.. . . . .	"	"	"
Clark City.. . . . .	"	"	"
Seven Islands.. . . . .	"	"	"
River Moisie.. . . . .	"	"	"
Little River.. . . . .	"	"	"
Sheldrake.. . . . .	"	"	"
Thunder River.. . . . .	"	"	"
Magpie.. . . . .	"	"	"
St. John River.. . . . .	"	"	"
Long Point.. . . . .	"	"	"
Mingan.. . . . .	"	"	"
Point Esquimaux.. . . . .	"	"	"
Betchouanes.. . . . .	"	"	"
Piastre Bay.. . . . .	"	"	"
Watichou.. . . . .	"	"	"
Aguanus.. . . . .	"	"	"
Natashquan.. . . . .	"	"	"
Kegaska.. . . . .	"	"	"
Masquaro.. . . . .	"	"	"
Big Romaine.. . . . .	"	"	"
Wolfe Bay.. . . . .	"	"	"
Pointe du Maurier.. . . . .	"	"	"
Harrington.. . . . .	"	"	"
Whale Head.. . . . .	"	"	"
Baie des Moutons.. . . . .	"	"	"
Bay de Ha.. . . . .	"	"	"
St. Augustin.. . . . .	"	"	"
Coxipi.. . . . .	"	"	"
Rockey Bay.. . . . .	"	"	"
St. Paul River.. . . . .	"	"	"
Brador Bay.. . . . .	"	"	"
Bonne Espérance (St. Paul's River).. . . . .	"	"	"
Forteau Bay.. . . . .	"	"	"
Points Amour.. . . . .	"	"	"
Red Bay.. . . . .	"	"	"
Chateau Bay.. . . . .	"	"	"
Belle Isle.. . . . . 50-2	"	"	"
Anticosti Id. via Long Point.	"	"	"

## ONTARIO.

*Line from Leamington to Pelee Island (Telephone Circuit)—Local rates between Leamington and Point Pelee 15-1; mainland and Island offices 25-1; offices on the Island 15-1 (8 offices).*

Gun Club House, mainland...15-1 (thro' business) from Leamington, G. N. W.			
Pointe Pelee, mainland.. . . .	"	"	"
Leamington Dock.. . . . .	"	"	"
North Pt. Lt. H'se, Pelee Island	"	"	"
North Dock, Pelee Island.. . .	"	"	"
McIntyre's Corners.. . . . .	"	"	"
West Dock, Pelee Island.. . . .	"	"	"
South Dock.. . . . .	"	"	"



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## NORTH-WEST TERRITORIES.

*Line from Qu'Appelle (C.P.R. Sta.) to Edmonton, Alberta—Local rates, 15-1, 25-2, 50-3, for distances 10 to 600 miles (13 offices).*

Fort Qu'Appelle.. . . . .	25-2	Qu'Appelle or Saskatoon.
Touchwood.. . . . .	"	"
Saskatoon (Ts. office C. P. R. Tel.)..	"	"
Henrietta.. . . . .	"	"
Battleford.. . . . .	"	"
Bressaylor.. . . . .	25-2	Saskatoon ; 50-3 Qu'Appelle or Edmonton.
Onion Lake.. . . . .	"	"
Moose.. . . . .	"	"
St. Paul de Métis.. . . . .	50-3	Saskatoon, Qu'Appelle or Edmonton.
Saddle Lake.. . . . .	"	"
Victoria.. . . . .	25-2	Edmonton ; 50-3 Qu'Appelle or Saskatoon.
Star.. . . . .	"	"
Fort Saskatchewan.. . . . .	"	"
Edmonton (Transfer office C. P. R. Tel.).. . . . .	"	"

*Line from Moosejaw (C. P. Stn.) to Wood Mountain—Local rates 25-2 (1 office).*

Wood Mountain.. . . . .	25-2 from Moosejaw.
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## BRITISH COLUMBIA.

*Line from Victoria to Cape Beale—Local rate 50-3 (6 offices).*

Sooke.. . . . .	50-3 from Victoria C. P. R. Tel. office.
Otter Point.. . . . .	"
Jordan River.. . . . .	"
Port San Juan.. . . . .	"
Carmanah Lt. House.. . . . .	"
Cape Beale.. . . . .	"

*Line from Nanaimo to Comox—Local rate 25-2 (9 offices).*

Wellington (C.P.R. & E. & N. Ry.).. . . . .	25-2 from Nanaimo.
Parksville.. . . . .	" or Wellington.
Fanny Bay.. . . . .	"
Cumberland.. . . . .	"
Union Bay.. . . . .	"
Union Mines.. . . . .	"
Courtney.. . . . .	"
Comox.. . . . .	"
Alberni (branch).. . . . .	"

*Line from Alberni to Cape Beale—Local rate 50-3.*

Between offices on the Victoria-Cape Beale line and the Nanaimo-Comox line, via Alberni, 50-3.

*Line from Golden to Windermere—Local rate 25-2 (3 offices).*

1. Athalmer.. . . . .	25-2 from Golden (C.P.Ry.)
2. Wilmer.. . . . .	"
3. Windermere.. . . . .	"

*Line from Kamloops to Lower Nicola (Telephone) (8 offices).*

Connections are leased and lessees allowed commission on messages of non-subscribers. Tariff 25-2 local and from Kamloops.



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## YUKON TELEGRAPH LINE.

## THROUGH TARIFF TO AND FROM ASHCROFT.

(IN EFFECT FROM JUNE 1, 1902.)

No.	Names of Offices. (June 13, 1903.)	LINE MILEAGE.		Tariff.	
		Inter- mediate.	Progres- sive.	\$ cts.	Night Rate.
1	Ashcroft . . . . .	0	0	0	
2	Pavilion. } Branch from Ashcroft. . . . . {	40	40	25 & 2	25 & 1
3	Lillooet. } . . . . . {	22	62	25 & 2	25 & 1
4	Clinton. . . . .	30	30	25 & 2	25 & 1
5	115 Mile House. . . . .	55	85	25 & 2	25 & 1
6	150 Mile House. . . . .	35	120	50 & 3	30 & 2
7	Harpers' Camp. } . . . . . {	33	153	50 & 3	30 & 2
8	Bullion. } Branch from 150-Mile House. . . . . {	27	180	50 & 3	
9	Quesnel Forks. } . . . . . {	4	184	50 & 3	3 & 2
10	Soda Creek. . . . .	42	162	50 & 3	30 & 2
11	Alexandria. . . . .	28	190	50 & 3	
12	Quesnel. . . . .	26	216	50 & 3	30 & 2
13	Barkerville (branch from Quesnel). . . . .	61	277	50 & 3	
	Refuge House. . . . .	16	232		
	Mead River Refuge House. . . . .	15	247		
14	Blackwater. . . . .	22	269	75 & 5	
	Shovel Creek R. House . . . . .	20	289		
15	Bob Tail Creek. . . . .	25	314	75 & 5	
	Refuge House. . . . .	17	331		
16	Stoney Creek. . . . .	18	349	75 & 5	
	Refuge House. . . . .	17	366		
17	Fraser Lake. . . . .	18	384	75 & 5	
	Stella Refuge House. . . . .	20	404		
	Shoal Creek R. House . . . . .	20	424		
18	Burns Lake. . . . .	29	453	75 & 5	
	Refuge House. . . . .	15	468		
19	South Buckley. . . . .	15	483	75 & 5	
20	North Buckley. . . . .	25	508	100 & 7	
21	Buckley Ranch. . . . .	27	535	100 & 7	
22	Mauricetown. . . . .	35	570	125 & 10	
23	Hazleton. . . . .	40	610	125 & 10	
24	Meanskinisht. } . . . . . {	35	645	125 & 10	
25	Skeena Canyon. } . . . . . {	47	692	125 & 10	
26	Lorne Creek. } Branch from Hazleton. . . . . {	24	716	125 & 10	
27	Telegraph Point. } . . . . . {	53	769	150 & 10	
28	Aberdeen. } . . . . . {	4 $\frac{1}{2}$	773 $\frac{1}{2}$	150 & 10	
29	Port Simpson. } . . . . . {	39	812 $\frac{1}{2}$	150 & 10	
30	1st Cabin. . . . .	27	637		
	Kuldo . . . . .	28	665	125 & 10	
	3rd Cabin. . . . .	25	690		
	4th Cabin. . . . .	20	710		
	5th Cabin. . . . .	20	730		
	6th Cabin . . . . .	20	750		
	7th Cabin. . . . .	19	769		
	8th Cabin . . . . .	19	788		
	9th Cabin . . . . .	17	805		
	Refuge House . . . . .	17	822		

No night rates beyond Quesnelle.



YUKON TELEGRAPH LINE—*Concluded.*

THROUGH TARIFF TO AND FROM ASHCROFT.

(IN EFFECT FROM JUNE 1, 1902.)

No.	Names of Offices.	LINE MILEAGE.		Tariff.	
		Inter-mediate.	Progres-sive.	\$ cts.	Night Rate.
31	Echo Lake .....	15	837	150 & 10	No night rates beyond Quenel.
	Refuge House .....	4	841		
	25-Mile Cabin .....	21	862		
32	Iskoot .....	16	878	150 & 10	
	Refuge House .....	20	898		
33	Sheep Creek .....	20	918	175 & 10	
34	Telegraph Creek .....	21	939	175 & 10	
	Tahltan Refuge House .....	25	964		
35	Shesley .....	20	984	175 & 10	
	Dudadoptu Refuge House .....	18	1,002		
	80-Mile Coast R. House .....	25	1,027		
36	Nahlin .....	18	1,045	185 & 10	
	Refuge House (North Branch) .....	26	1,071		
37	Nakeena .....	23	1,094	185 & 10	
	Table Creek Refuge House .....	20	1,114		
	Pike Lake .....	10	1,124		
38	Pike River .....	10	1,134	200 & 15	
39	Atlin .....	23	1,157	200 & 15	
	Refuge House .....	15	1,172		
	Center Cabin .....	20	1,192		
	Refuge House .....	20	1,212		
40	Tagish .....	20	1,232	225 & 15	
41	Cariboo Crossing (Branch from Tagish) .....	18	1,250	225 & 15	
42	White Horse .....	65	1,297	250 & 15	
43	Lower Lebarge .....	59	1,356	250 & 15	
44	Hootalinqua .....	30	1,386	250 & 15	
45	Big Salmon .....	34	1,420	250 & 15	
	Tantalus Refuge House .....	66	1,486		
46	Five Fingers .....	30	1,516	275 & 15	
47	Fort Selkirk .....	58	1,574	275 & 15	
48	Selwyn .....	30	1,604	275 & 15	
49	Stewart River .....	75	1,679	300 & 20	
50	Ogilvie .....	23	1,702	300 & 20	
51	Dawson .....	48	1,750	300 & 20	
52	Forty Mile .....	55	1,805	325 & 20	
53	Boundary (Fort Egberton) .....	40	1,845	325 & 20	
	Add Branch lines in list .....		407½		
	Total miles .....		2,252½		

The names of places in the above list not numbered are testing stations and shelter huts for linemen.

The rates given above for points north of Quesnel are one-third less than those primarily adopted, which were calculated on the general basis of 50 cents for 100 miles and 25 cents for each additional 100 miles, counting the distance from Ashcroft.

The local rates between offices north of Quesnel are calculated on the basis of 50 cents for 100 miles and 25 cents for each additional 100 miles, and the local rates between offices north of Atlin are fixed at 50 cents for each 100 miles.

Cable messages.—On transatlantic business the word rate is twice as much as the additional word rate given in the list for all points north of Ashcroft:—Barkerville, 3 × 2 = 6c.; Dawson, 20 × 2 = 40c. per word.



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On trans-Pacific business the word rate is the additional word rate plus 4c.: Barkerville,  $3 + 4 = 7$ c.; Dawson,  $20 + 4 = 24$ c. per word to or from Ashcroft.

## SUMMARY.

Offices on government lines, as listed . . . . .	244
Offices at transfer points with connecting lines . . . . .	15
	<hr/>
Total number embraced by the service . . . . .	259







PART VI

---

REPORT OF THE COLLECTOR OF REVENUE

DEPARTMENT OF PUBLIC WORKS

1902-1903







# COLLECTION OF REVENUE.

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, November 14, 1903.

F. GELINAS, Esq.,  
Secretary, Department of Public Works,  
Ottawa.

SIR,—I have the honour of submitting my report for the year ended June 30, 1903.

I have examined the books and accounts of all the officers under my control (excepting those of the Dock Master at Esquimalt), and it is my pleasing duty to state that in all cases the rules laid down for their guidance by the department have been carefully observed by these officers, who have faithfully accounted for all the revenues collected by them.

During the past fiscal year the revenue accrued from public works shows an increase of \$36,386.82 compared with the year 1901-2; the total amounting to \$128,457.63, against \$92,070.81 in 1901-2.

The collections also show an increase of \$32,556.57, being in all \$127,988.13.

The revenue from slides and booms was \$77,992.48, or \$24,017.30 more than the dues accrued in 1901-2. The collections amounted to \$77,522.98, or \$20,187.05 more than the previous year. Overcharges amounting to \$313.43 were written off, and the amount outstanding uncollected June 30 last increased by \$156.07.

The graving docks yielded \$45,877.08, or \$8,528.10 more than in 1901-2.

From the locks the receipts were \$638.06, an increase of \$92.41.

From rents the revenue was \$3,950.01, being \$3,749.01 more than the preceding year.

Having dealt with the revenue in a general way, I beg to submit the particulars in detail relating to the several services, under their respective heads.

## SLIDES AND BOOMS.

### OTTAWA DISTRICT.

The tolls charged up amounted to \$46,337.38, or \$8,414.15 more than in 1901-2.

The number of sawlogs that passed through the works was 4,064,607, or 776,870 more than the preceding year.

Of square timber, there were 18,442 pieces, against 15,834 in 1901-2. All the revenue accrued in this district during the year just closed was collected, excepting \$313.43 overcharges written off.

Of the dues accrued since July 1, 1889, when this department took over the collection, there remains uncollected \$9,836.30, full particulars of which will be found in statement No. 2 herewith.

Of the dues accrued prior to July 1, 1889, there remains uncollected \$56,805.65, all of which should be written off. See statements Nos. 1 and 3 herewith for details.



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The accounts for the Ottawa district stand thus :—

Dues accrued during the year 1902-03 .. .. .	\$46,337 38
Of which there was written off.. .. .	\$ 313 43
Collected.. .. .	46,023 95
	<hr/> 46,337 38

The amount outstanding uncollected is the same as at the close of the previous year, the amount, year by year, being as follows:—

Dues accrued prior to the collection being transferred to this department, . . . . .	\$56,805 65
Dues of 1889-90.. .. .	\$6,903 05
“ 1890-91.. .. .	28 42
“ 1892-93.. .. .	379 80
“ 1896-97.. .. .	196 71
“ 1900-01.. .. .	2,328 32
	<hr/> 9,836 30

I would again ask particular attention to the fact, that since this department assumed the collection of these dues, of the amount accrued, viz., \$754,160.59, all but \$28.42 absolutely owing to the department has been collected; the remainder above shown and aggregating \$9,807.88, being composed of Chaudiere boomage \$6,903.05, which should have been written off long ago, and the balance being covered by counter claims which, if my information be correct with regard to them, ought to be allowed.

Herewith are statements in detail:—

No. 1.—Statement of amounts outstanding prior to July 1, 1889 uncollected September 30, 1903.

No. 2.—Statement of dues accrued at Ottawa since July 1, 1889, uncollected September, 1903.

No. 3.—Statement of amounts accrued at Quebec prior to July 1, 1889, uncollected September 30, 1903.

No. 4.—Statement of the number of pieces of square timber, sawlogs, &c., which passed through the Ottawa works during the year ended June 30, 1903.

No. 5.—Statement of dues accrued from each of the slides and works in the Ottawa district during the year ended June 30, 1903.

The satisfactory increase in the revenue from this particular district does not arise from extraordinary operations on any particular stream, but was almost a general advance, for only on two streams, viz., the Rivers Madawaska and Dumoine, where the tolls were less than the preceding year, the Madawaska being \$855.85, and the Dumoine \$122.07 smaller than 1901-02.

Nevertheless the revenue was nearly \$3,000 short of the estimated income when the present tariff was imposed, but this can I think be attributed to the large number of small logs now taken out which a few years ago would not be brought down.

Before closing these remarks on the Ottawa district, I would again respectfully urge the desirability of having the question of the arrears appearing as uncollected, brought before the Public Accounts Committee, not only for the Ottawa district, but those from the other districts as well, so as to obtain the authority of parliament to write them off, as they are a source of friction between the government and the individuals interested, frequently preventing settlement of accounts justly due individuals, while the amounts standing against them should have been written off long ago.

#### ST. MAURICE DISTRICT.

The revenue from this district was \$29,232.33, more than the preceding year by \$15,666.85.

The number of pieces of timber of all kinds which passed through the works was 2,533,838 pieces, and 140 cords of pulp wood.



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All the dues of 1902-03 were collected. Since I took charge of this district, in 1892, all the revenue accrued has been collected.

The amount outstanding remains the same as at the close of the preceding year, viz., June 30, 1902, namely, \$14,481.49, all of which should be written off for reasons assigned in Statement No. 6 herewith.

The spring of 1903 was a most remarkable one for this district, there being no rain until the beginning of June; in consequence the water in the St. Maurice was very low, and up to that time it seemed as if the bulk of the logs would not come down, however, when the rains set in, the water rose satisfactorily and kept at a fair level all summer, thus most of the logs were gotten out.

Those which were left behind in the tributaries will, under ordinary circumstances, be perfectly safe next spring.

Although there was no freshet on the St. Maurice this spring, I would again urge, in view of the magnitude of the interests involved, the providing in the near future of a means of retaining the waters of the great lakes at its head in the early spring months, and so preventing such disastrous floods as have occurred in the past whereby not only the lumbermen suffered great loss of property, but the government also through the works being carried away or damaged lost heavily, even in recent years. With such a system for retaining the water in the spring, the supply during the dry months of midsummer could be regulated and much of the difficulties experienced in recent years, if not overcome, at least be modified to a great extent, as the forests are being denuded so rapidly, the snow melts more quickly than formerly in the spring, the water so resulting together with the usual spring rains coming all at once, form a flood that is likely to be greater every year as time goes on.

The department is interested in a very great degree in devising such a system as suggested, having such large sums invested in the works on the St. Maurice, and moreover if the logs are not prevented from going into the St. Lawrence, not only the lumberman is the loser, but the government is deprived of the revenue which it would otherwise have derived from the timber.

Such a scheme, if my information is to be relied on, would not cost a very large sum, in comparison with the interests involved, and I feel confident that not only the lumbermen but the manufacturers whose mills are driven by water, would gladly contribute to its cost and maintenance, while the provincial government might also be asked to assist.

I may say here that lest anyone might be carried away by an exaggerated idea of quantity, when the millions of logs taken out on the St. Maurice are mentioned, that the vast majority of the logs are spruce and a very great portion of them are very small, as they take for making pulp everything down to four inches at the top, in fact I have seen some as small as two inches.

## NEWCASTLE DISTRICT.

The dues accrued from this district during the year amounted to \$2,422.77, all of which was collected but \$156.07 due by Gilmour & Co.

The total outstanding uncollected on June 30, 1902, was \$7,969.53, of which \$3,521.19 should be written off in accordance with a judgment in the Exchequer Court; the remainder consists of an account in the hands of the Department of Justice for collection and amount due by Gilmour & Co., to which is to be added the \$156.07 above mentioned.

With regard to the amount due by Gilmour & Co., I may say here, that they are in treaty with another department of the government for the sale of certain properties owned by them which would be of very great use to the government and settlement of the account with this department is only waiting the decision as to this sale, whether favourable or not.



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## GRAVING DOCKS.

## ESQUIMALT GRAVING DOCK.

The revenue from this source, shown in detail in statement No. 8 herewith, was \$13,669, being \$833.24 less than in 1901-2.

Of the 211½ days the dock was occupied during the year, it was used by the British navy for 168½ days, Canadian government vessels for 6 days, while the mercantile marine used it for 37 days.

## LEVIS GRAVING DOCK.

The revenue from this work was \$5,891.90 more than for the previous year, being for 1902-3, \$23,888.90. See statement No. 9 herewith.

The dock was occupied for 148 days, exclusive of the winter months, during which it was occupied by the steamship '*Iberian*.'

## KINGSTON GRAVING DOCK.

The dock was occupied for 123 days, exclusive of winter months. The income was for the past year, \$8,319.18, or \$3,469.44 more than the previous year. See statement No. 10.

## LOCKS.

By Order in Council of July 28, 1903, the tolls on the locks were abolished for two years, and all tolls collected since the beginning of the season of navigation of this year directed to be refunded.

## RIVIÈRE DU LIÈVRE LOCK.

The tolls collected amounted to \$279.78, being 34 cents more than last year. Of this amount, \$132.37 was refunded under the Order in Council above referred to.

## RIVIÈRE YAMASKA LOCK.

The receipts from this source were \$358.28, or \$92.07 more than the previous year. Of this, \$118.93 were refunded under the authority above quoted.

## RENTS.

The collections on this account were as follows:—

From old Post Office Building, Victoria, B.C.....	\$3,792 01
Old Post Office Building, St. John, N.B....	150 00
Edmonton Bridge (5 years).....	5 00
Water lot, Port Morien, N.S....	1 00
Part Toronto Island.....	1 00
Land in Kingston, Ont....	1 00

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\$3,950 01



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Thus the total revenue that passed through my hands during the year ended June 30, 1903, may be summarized as follows:—

From Slides and Booms.. . . . .	\$77,522 98
Graving Docks.. . . . .	45,877 08
Locks.. . . . .	638 06
Rents.. . . . .	3,950 01
	<hr/>
	\$,127,988.13

The following comparative table of Public Works revenue accrued 1902-3 and 1901-2 shows at a glance in what accounts the increases and decreases herein referred to occurred:—

	Year. 1902-03	Year. 1901-02	Increase. 1902-03	Decrease. 1902-03
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
SLIDES AND BOOMS.				
Ottawa District.....	46,337 38	37,923 23	8,414 15	.....
St. Maurice District.....	29,232 33	13,565 48	15,666 85	.....
Newcastle District.....	2,422 77	2,486 47	.....	63 70
	77,992 48	53,975 18	24,081 00	63 70
Net increase, 1902-03.....	.....	.....	24,017 30	.....
GRAVING DOCKS.				
Esquimalt, B. C.....	13,669 00	14,502 24	.....	833 24
Levis, Que.....	23,888 90	17,997 00	5,891 90	.....
Kingston, Ont.....	8,319 18	4,849 74	3,469 44	.....
	45,877 08	37,348 98	9,361 34	833 24
Net increase, 1902-03.....	.....	.....	8,528 10	.....
LOCKS.				
Rivière du Lièvre.....	279 78	279 44	34	.....
Rivière Yamaska .....	358 28	266 21	92 07	.....
	638 06	545 65	92 41	.....
Rents.....	3,950 01	201 00	3,749 01	.....

In conclusion, I have to acknowledge the uniform courtesy and cheerful assistance accorded me at all times by the officers with whom I have been brought in contact during the year.

I have the honour to be, respectfully, sir,

Your very obedient servant,

EDWARD T. SMITH,

*Collector of Public Works Revenue.*



No. 1.—STATEMENT of Slidage and Boomage from the Ottawa Slides and Works, accrued prior to July 1, 1889, Outstanding June 30, 1903, and remaining uncollected on September 30, 1903.

By Whom due.	Bad and Doubtful Debts.	Chaudière Boomage in Suspense.	Other Slide and Boom Dues Disputed.	Total Outstanding on Sept. 30, 1902.	Year to which Dues Belong.	Remarks.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.		
John & Wm. McLean.	53 14			53 14	1873.	Insolvent.
John Rowan.	342 50			342 50	1872-1873.	"
Lemieux & Charette.	21 30			21 30	1873.	"
Tailon & Lapierre.	148 10			148 10	1873-1874.	"
Mosgrove & McHarry.	261 42			261 42	1873-1874.	"
W. C. Wells.	600 90			600 90	1873-1874.	"
Dufresne & McGarity.	528 80			528 80	1874-1875.	"
Walton Smith.	171 46			171 46	1874-1875.	"
A. H. Baldwin.	3,507 92			3,507 92	1871 to 1874.	"
Hon. James Skead.	9,807 65			9,807 65	1861, 1863, 1864, 1869, 1875 to 1878.	"
Batson & Currier.	5,558 70			5,558 70	1875 to 1877.	"
A. F. A. Knight.	546 30			546 30	1878.	"
James Walker.	11 25			11 25	1877.	"
R. Campbell & Son.	1,558 50			1,558 50	1879 to 1881.	"
James G. Bryson.	73 50			73 50	1886.	"
Costello Bros.	90 62			90 62	1882.	"
N. E. Cormier.	428 34			428 34	1888.	"
James Yuill.	9 29			9 29	1876.	Overcharge.
J. & B. Grier.	76 84			76 84	1883.	"
R. & W. Conroy.	95 42			95 42	1882-1883.	"
A. & P. White.	101 00			101 00	1881.	"
B. Caldwell & Son.	4 33			4 33	1887.	"
J. R. Booth.		9,871 93	398 88	10,270 81	1881 to 1888.	reported in return S—38, for March, 1886.
Perley & Pattee.		8,889 85		8,889 85	1881 to 1888.	\$398.88, counter claim for damages by the breaking of Coulonge Boom.
The Bronsons & Weston Lumber Co.		8,180 79		8,180 79	1881 to 1888.	
Pierce & Co.		462 18		462 18	1888.	
G. A. Grier & Co.		1,060 59		1,060 59	1886-1887.	*Chaudière boomage. These parties claim that they have maintained these works wholly at their own expense since 1881.
Estate late Levi Young.		1,461 20		1,461 20	1881 to 1885.	
Wm. Mason.		413 85		413 85	1881 to 1888.	
Gilmour & Co.		406 27		406 27	1884.	
John Rochester.		258 88		258 88	1881 to 1883.	



J. & G. Bryson.....	.....	.....	.....	.....	.....	Counter claim for damage by breaking of Coulonge Works.
23,997 28	31,006 54	252 20	252 20	1886....	252 20	
		651 08			55,653 90	

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1903.

EDWARD T. SMITH,  
Collector of Slide and Boom Dues.

No. 2—STATEMENT of Slide and Boom Dues, accrued from the Ottawa River Works since July 1, 1889, Outstanding on September 30, 1903.

Name.	Year to which Dues belong.	Chaudière Boomage in Suspense.	Ordinary Dues.	Total Outstanding	Remarks.
J. R. Booth.....	1889-90	\$ 2,561 69	\$ cts.	\$ 2,561 69	Chaudière Boomage reported to Council, and referred to the Treasury Board, should be written off.  Legal action taken to recover this. Retained by Mr. Booth in settlement of an account due him which the Auditor General refuses to pay, as Mr. Booth appears to be in arrears in this and Statement No. 1.  Have counter claim for work done on slide to this amount. Have counter claim for damages to logs in consequence of break in Black River slide.
The Bronsons & Weston L. Co...	1889-90	2,056 96	.....	2,056 96	
Perley & Pattee.....	1889-90	1,203 26	.....	1,203 26	
Wm. Mason & Sons.....	1889-90	167 66	.....	167 66	
Pierce & Co.....	1889-90	913 48	.....	913 48	
Alex. Fraser acc. Thos. Stephens.	1890-91	.....	28 42	28 42	
J. R. Booth .....	1892-93	.....	379 80	379 80	
Bryson & Fraser .....	1896	.....	196 71	196 71	
McLachlin Bros.....	1900	.....	2,328 32	2,328 32	
.....	.....	6,903 05	2,933 35	9,836 30	

EDWARD T. SMITH,  
Collector of Slide and Boom Dues.



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No. 3.—STATEMENT of Outstanding Slide Dues, Ottawa District, Bonds for which were sent to Quebec for Collection.

Name.	From 1860.	From 1861.	Total.
	\$ cts.	\$ cts.	\$ cts.
Hon. James Skead .. .. .	245 00	210 00	455 00
James Mair. .... .	.....	696 75	696 75
	245 00	906 75	1,151 75

These amounts were uncollected, as the parties claimed damages for loss caused by the Madawaska boom breaking in 1860.

A decision on their claims was not arrived at till August 2, 1869. On the 5th idem Messrs. Skead and Mair were notified that the department could not recognize their claim.

To the best of my knowledge, this decision was never communicated to the collector of slide dues, consequently these accounts remained in abeyance.

Since then both parties died, and I believe both were insolvent at the time of their death.

EDWARD T. SMITH,  
*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1903.

No. 4.—Statement of the number of pieces of square timber, saw logs, &c., that passed through the government slides and works on the River Ottawa and its tributaries during the fiscal year ended June 30, 1903.

	Pieces.
Square timber.. . . .	18,442
Saw logs.. . . .	4,064,607
Boom and dimension timber .. . . .	93,045
Cedars.. . . .	85,125
Railroad ties .. . . .	606,938
Fence posts .. . . .	247,154
Total.. . . .	5,115,311

Also 25,743½ cords pulp wood and 3 scows. Revenue accrued on above was \$46,337.38.

EDWARD T. SMITH,  
*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1903.



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No. 5.—Statement showing the dues accrued on the undermentioned works on the River Ottawa and its tributaries during the fiscal year ended June 30, 1903.

River or other Improvement.	Amount.
Main Ottawa.....	\$ 5,203 90
Cheneuax boom.....	7,191 57
River Petewawe.....	8,368 38
“ Madawaska .....	2,958 89
“ Coulonge.....	8,653 96
“ Dumoine.....	316 87
Black river.....	4,888 28
Gatineau .....	8,755 53
	<hr/>
	\$46,337 38

EDWARD T. SMITH,  
*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1903.

No. 6.—STATEMENT of Slide and Boom Dues from the St. Maurice Slides and Works outstanding on June 30, 1903, and remaining uncollected on September 30, 1903.

Name.	Year to which Dues belong.	Amount.	Total.	Remarks.
		\$ cts.	\$ cts.	
George Baptist, Son & Co.	1878	469 95	4,859 02	Have counter claims for damages to logs caused by the booms not being stretched early enough in the spring of 1878 to prevent the logs going over the chutes. These claims were submitted to Special Commissioner, Mr. McDougall, afterwards Judge, who, after hearing the evidence on both sides, recommended that the claims of the parties should be allowed.
"	1879	2,110 62		
"	1880	1,696 18		
"	1881	293 69		
"	1882	165 30		
"	1884	118 50		
"	1888	4 28		
Ross, Ritchie & Co	1878	3,072 84	5,281 48	
"	1883	2,173 68		
"	1884	28 96		
"	1886	1 62		
"	1887	4 38		
Alex. Baptist	1879		2,116 96	
Wm. Ritchie & Co.	1888	779 24	1,111 35	Of this amount, \$754.20 is claimed to be an overcharge. Insolvent.
"	1889	332 11		
Ritchie Bros.	1886	413 43	1,048 14	This amount is composed of overcharges in 1886 and 1887 of \$842.76 and overpayment in 1884 of \$205.38.
"	1887	634 71		
G. B. Hall	1890		49 34	Insolvent.
T. E. Normand	1890		42 28	Claims that this balance is an overcharge.
Trefflé Biron	1891		0 92	Would cost more to collect than it is worth.
			14,481 49	

To make this balance agree with the Public Accounts, there should be deducted \$7.93 over credited Alex. Baptist, and \$217.17 added thereto, being \$190.40 paid July 23, 1884, and \$26.77 over charged in error to Wm. Little, not in any of the collector's returns, which will give balance due September 30, 1894, of \$14,690.73.

EDWARD T. SMITH,  
*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1903.



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No. 7.—STATEMENT of Slide and Boom Dues accrued from the Newcastle and Trent River Works, outstanding on June 30, 1903, and remaining uncollected on September, 30, 1903.

Name.	Year to which Dues belong.	Amounts disputed.	Ordinary Dues.	Total.	Remarks.
		\$ cts.	\$ cts.	\$ cts.	
Irwin & Boyd . . . . .	1881 . . . . .	59 79		59 79	} Insolvent.
Thomson & McArthur.	1880 . . . . .	52 78		52 78	
Jabez Thurston . . . . .	1882 . . . . .	12 50		12 50	
McDougall & Ludgate.	1879 . . . . .	65 07		65 07	
Bigelow & Trounce . . . . .	1882 to 1885 . . . . .	216 21		216 21	
R. G. Strickland . . . . .	1882, '83, '85, '86 and '87..	215 08		215 08	} Dead and estate distributed.
Est. late Geo. Hilliard.	1877 to 1883 and 1886 . . . . .	354 15		354 15	
T. G. Hazlett . . . . .	1881, '82, '84 to '89 . . . . .	885 25		885 25	} According to judgement in Exchequer Court, <i>re</i> Boyd <i>vs.</i> Smith, these cannot be collected.
J. M. Irwin . . . . .	1882, '83, '85 to '88 . . . . .	698 45		698 45	
D. Ulliyott . . . . .	1881 to 1887 . . . . .	547 68		547 68	
Green & Ellis . . . . .	1881 to '83, '85, '88 and '89	157 01		157 01	
A. W. Parkin . . . . .	1884, '85, '88, '90 and 91..	65 92		65 92	
The Dickson Estate . . . . .	1883 . . . . .	137 50		137 50	
Alfred McDonald . . . . .	1888 . . . . .	40 80		40 80	
John Parkin . . . . .	1889 . . . . .	13 00		13 00	} Sent to Dept. of Justice for collection.
Gilmour & Co. . . . .	1893, '94, '95, 1900, '01, '02 . . . . .		4,568 71	4,568 71	
John Dovey . . . . .	1894, '95, '96 . . . . .		35 70	35 70	
		3,521 19	4,604 41	8,125 60	

EDWARD T. SMITH,  
*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1902.



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## No. 8.—THE DRY DOCK AT ESQUIMALT, B.C.

STATEMENT of Dues and other charges collected during the Year ended June 30, 1903.

Name of Vessel Docked.	Tonnage.	PERIOD OF DOCKAGE.		Dockage Charges.	Other Charges.	Total.
		From	To			
		1902.	1902.	\$ cts.	\$ cts.	\$ cts.
H.M.S. Phaeton.....	4,300	June 30..	July 4..	211 40	.....	211 40
S.S. Arab.....	4,248	July 16..	" 18..	650 00	.....	650 00
S.S. Servia.....	1,867	" 19..	" 23..	692 00	.....	692 00
Marine Railway Company.....		9,000 galls. water at 60c. per mill. ....			5 40	5 40
B.C. Stevedoring Company.....		7,000 galls. water at 60c. per mill. ....			4 20	4 20
H.M.S. Virago.....	265	July 28..	Aug. 4..	} 324 31	.....	324 31
H.M.S. Sparrowhawk.....	265	" 28..	" 4..		.....	
S.S. Lyra.....	4,417	Aug. 11..	" 13..	529 00	.....	529 00
H.M.S. Amphion.....	4,300	" 13..	Oct. 23..	2,686 25	.....	2,686 25
H.M.S. Shearwater.....	980	Oct. 24..	" 27..	142 06	.....	142 06
H.M.S. Grafton.....	7,500	" 27..	Nov. 7..	446 30	.....	446 30
S.S. Edith.....	2,369	Dec. 1..	Dec. 11..	1,480 00	22 20	1,502 20
B.C. Stevedoring Company.....		7,800 galls. water at 60c. per mill. ....			4 68	4 68
S.S. Tacoma.....	2,811	Jan. 18..	Jan. 19..	400 00	3 60	403 60
H.M.S. Virago.....	265	} Jan. 21..	Feb. 2..	493 52	.....	493 52
H.M.S. Sparrowhawk.....	265		" 13..	398 75	.....	398 75
H.M.S. Egeria.....	940	Feb. 3..	" 13..	398 75	.....	398 75
Ship Alsternixe.....	3,045	Mar. 11..	Mar. 26..	1,814 00	6 60	1,820 60
H.M.S. Amphion.....	4,300	" 26..	April 3..	302 01	.....	302 01
H.M.S. Virago.....	265	} April 3..	" 8..	288 72	.....	288 72
H.M.S. Sparrowhawk.....	265		" 8..	288 72	.....	288 72
H.M.S. Grafton.....	7,500	April 16..	May 3..	690 55	.....	690 55
H.M.S. Shearwater.....	980	May 5..	" 9..	204 71	.....	204 71
Ship Ivanhoe.....	1,438	" 10..	" 11..	350 00	3 00	353 00
Str. City of Topeka.....	1,057	" 17..	" 18..	350 00	1 20	351 20
Str. Ameer.....	907	" 21..	" 23..	347 50	2 40	349 90
Str. Quadra and scow.....	573	" 11..	" 16..	450 00	.....	450 00
H.M.S. Flora.....	4,360	June 11..	June 19..	364 58	.....	364 58
.....		Overpaid.....		0 06	.....	0 06
	59,442			13,615 72	53 28	13,669 00

EDWARD T. SMITH,

*Collector of Public Works Revenue.*

DEPARTMENT OF PUBLIC WORKS,

OTTAWA, September 30, 1903.



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No. 9.—THE DRY DOCK AT LÉVIS.

STATEMENT of Dues and other charges collected during the Year ended June 30, 1903.

Name of Vessel Docked.	Tonnage.	PERIOD OF DOCKAGE.		Dockage Charges.	Other Charges.	Total.
		From	To			
		1902.	1902.	\$ cts.	\$ cts.	\$ cts.
S.S. Sahara .....	4,089	June 29..	July 12..	1,913 14	23 75	1,936 89
S.S. Indiana .....	3,923	Entry fee.		200 00		200 00
" .....		July 13..	Sept. 8..	7,522 22	39 75	7,561 97
S.S. Minnewaska ..	5,270	Sept. 12..	Oct. 21..	6,260 60	20 00	6,280 60
S.S. Manchester Engineer..	4,300	Entry fee.		200 00		200 00
" .....		Oct. 26..	Nov. 7..	1,832 00	20 00	1,852 00
S.S. Iberian .....		Entry fee.		200 00		200 80
" .....	5,223	Nov. 11..	Nov. 15..	817 84		817 90
" .....		Wintering	to April 10,	3,316 90	20 00	3,336 04
		1903.	1903.			
Tug Frontenac and dredge Laurier....	790					
S.S. Saguenay.....	992	April 14..	April 23..	655 50		655 50
" .....		Entry fee.		200 00		200 00
S.S. Protector .....		May 22..	May 29..	447 20		447 20
		Entry fee.		200 00		200 00
	24,587			23,765 40	123 50	23,888 90

EDWARD T. SMITH,  
Collector of Public Works Revenue.

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1903.



SESSIONAL PAPER No. 19

## No. 10—THE DRY DOCK AT KINGSTON, ONT.

STATEMENT of Dues and Other Charges collected during the Year ending June 30, 1903.

Name of Vessel Docked.	Tonnage.	PERIOD OF DOCKAGE.		Dockage Charges.	Other Charges.	Total.
		From.	To.			
		1902.	1902.	\$ cts.	\$ cts.	\$ cts.
Str. Ramona.....	57	July 1..	July 2..	20 00		20 00
Str. Avon.....	1,417	" 11..	" 12..	191 70	5 00	196 70
Barge Augustus .....	802	" 15..	" 16..	140 70		140 70
Str. Idler.....	56	" 21..	" 22..	20 00		20 00
Str. Tecumseh .....	840	" 24..	" 26..	203 30		203 30
Str. John Milne .....	109	Aug. 1..	Aug. 2..	21 80		21 80
Barge E. Simon & Bro. ....	107	" 5..	" 6..	31 40		31 40
Cargo.	50					
Str. New York.....	295	" 11..	" 11..	69 50		69 50
Barge Valencia.....	543	" 14..	" 16..	142 31		142 31
Sch. Winifrid Plunkett.....	100	" 21..	" 22..	20 00		20 00
Str. Donnelly .....	319	" 25..	" 26..	63 80		63 80
St. Barge King Ben.....	145	" 28..	" 29..	29 00		29 00
Tug Mary.....	62	Sept. 6..	Sept. 8..	40 00		40 00
Str. New Island Wanderer.....	123	" 9..	" 10..	24 60		24 60
Barge Ceylon.....	908	" 15..	" 17..	214 86		214 86
Str. Lake Michigan.....	588	Oct. 8..	Oct. 11..	215 12	18 00	233 12
Cargo.	100					
Str. Hecla.....	1,110	" 13..	" 14..	161 00	5 00	166 00
Str. Tecumseh.....	840	" 16..	" 20..	320 90		320 90
Tug Petrel.....	346	" 21..	" 23..	93 42		93 42
Sch. Neelon.....	291	" 24..	" 29..	129 50		129 50
Str. Armstrong.....	181	" 29..	Nov. 1..	76 20	5 00	81 20
Str. International.....	395	Nov. 3..	" 19..	476 60	10 00	486 60
Ship Toledo .....	2,277	" 20..	" 27..	1,234 04		1,234 04
Govt. tug St. Paul and 2 scows..	45	Nov 27..	Dec. 17.	412 00	5 00	417 00
	160					
		1903.	1903.			
Tug Petrel.....	346	Mar. 26..	Mar. 27..	69 20	5 00	74 20
Barge Augustus.....	802	" 30..	" 31..	130 20		130 20
Barge Minnedosa.....	1,041	" 31..	April 1..	154 10		154 10
Str. S. Marshall.....	755	April 2..	" 3..	125 50		125 50
Tug Glide .....	78	" 6..	" 7..	20 00		20 00
Barge I. Stephenson.....	461	" 8..	" 10..	124 47		124 47
Str. Chicora.....	930	" 11..	" 14..	273 20	5 00	278 20
Str. Hecla.....	1,110	" 14..	" 18..	394 10	15 00	409 10
Str. Aletha.....	171	" 19..	" 19..	34 20		34 20
Str. Caspian.....	958	" 29..	May 2..	279 92		279 92
Str. North King.....	873	May 4..	" 8..	381 74		381 74
Str. Erin.....	651	" 8..	" 9..	115 10		115 10
S.S. Turret Cape.....	1,827	" 9..	" 10..	243 20		243 20
Sch. S. Neelon.....	291	" 11..	" 12..	58 20		58 20
Str. John Rugee.....	1,217	" 15..	" 18..	299 49	6 25	305 74
Str. Scout.....	180	" 20..	" 25..	106 00	10 00	116 00
Barge. Cornwall.....	586	" 29..	" 29..	108 60		108 60
Str. Rideau King .....	266	June 6..	June 7..	53 20		53 20
S.S. Turret Crown.....	1,827	" 19..	" 24..	754 76		754 76
Tug Mary.....	62	" 25..	" 27..	40 00		40 00
		1902.	1902.			
Two Scows.....	160	July 7..	July 10..	113 00		113 00
Totals.....	26,858			8,229 93	89 25	8,319 18

EDWARD T. SMITH,

Collector of Public Works Revenue.

DEPARTMENT OF PUBLIC WORKS,  
Ottawa, September 30, 1903.







PART VII

MISCELLANEOUS

ACTS OF PARLIAMENT, PASSED AT SESSION OF 1903, HAVING  
REFERENCE TO THIS DEPARTMENT.  
CONTRACTS LET BY THE DEPARTMENT.  
PROPERTY PURCHASED OR SOLD.  
PROPERTY, LEASED TO OR BY THE DEPARTMENT.  
CURATOR'S REPORT, NATIONAL ART GALLERY.  
NAMES OF CHIEF OFFICERS OF THE DEPARTMENT.  
NAMES OF OFFICIALS EMPLOYED ON SLIDES AND BOOMS.  
NAMES OF PERSONS EMPLOYED ON GRAVING DOCKS.  
NAMES OF ENGINEERS, FIREMEN AND CARETAKERS OF PUBLIC  
BUILDINGS.  
AND THE OFFICIAL CORRESPONDENCE OF THE DEPARTMENT

FOR THE

FISCAL YEAR ENDED JUNE 30, 1903.







DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, December 5, 1903.

SIR,—I have the honour to send you herewith the following statements concerning the transactions of the department during the last fiscal year with respect to contracts and property, and which are required for insertion in the annual report, 1902-3, viz :—

No. 1.—Statement of contracts let by this department during the fiscal year ended June 30 last.

No. 2.—Statement of property purchased and sold by this department during the same period.

No. 3.—Statement of property leased to and by the said department during the same period ; and

No. 4.—A list of some of the Public Acts of the Parliament of Canada passed at the last session and Orders in Council having reference to the department.

I have the honour to be, sir,

Your obedient servant,

J. A. CHASSÉ,

*Law Clerk.*

FRED. GELINAS, Esq.,

Secretary of the Department of Public Works,  
Ottawa.







# STATEMENTS

## SHOWING

1<sup>ST</sup>.—CONTRACTS LET BY THE DEPARTMENT OF PUBLIC WORKS OF CANADA, FROM JUNE 30, 1902 TO JUNE 30, 1903.

2<sup>ND</sup>.—PROPERTY PURCHASED OR SOLD BY THE DEPARTMENT OF PUBLIC WORKS DURING THE FISCAL YEAR ENDED JUNE 30, 1903.

3<sup>RD</sup>.—PROPERTY LEASED TO AND BY THE DEPARTMENT OF PUBLIC WORKS DURING THE FISCAL YEAR ENDED JUNE 30, 1903.



3-4 EDWARD VII., A. 1904

No. 1.—CONTRACTS let by the Department of Public Works of Canada from the 30th June, 1902, to the 30th June, 1903.

Works.	Names of Contractors.	Date of Contract	Amount.
			\$ cts.
<b>PUBLIC BUILDINGS.</b>			
<i>Nova Scotia.</i>			
Amherst, Post Office building. Supply of coal...	Minudie Coal Co'y Ltd..	July 11, 1902	172 50
Annapolis " " ....	A. M. King..	" 5, 1902	175 46
Antigonish " " ....	Acadia Coal Co'y..	" 26, 1902	62 04
Arichat " " ....	James Kenna.....	" 11, 1902	240 00
" Savings Bank " ....	" .....	" 11, 1902	
" Customs " ....	" .....	" 11, 1902	
" Post Office building. Heating Apparatus	Frank Powers.....	Jan'y 24, 1903	700 00
" Public building Fittings.....	Edward Doyle.....	March 19, 1903	1,750 00
Baddeck, Post Office. Supply of coal.....	The Cape Breton Coal Mining Co. Ltd.....	July 26, 1902	123 75
Dartmouth " " ....	Int'nial Coal Mining Co.	" 12, 1902	80 06
Digby " " ....	Canada Coal & Ry' Co. Lt	" 18, 1902	213 75
Guysborough, Public building. Heating apparatus	E. F. Munro .....	Dec. 23, 1902	1,100 00
" " Fittings.....	" .....	Jan'y 26, 1903	1,650 00
Halifax, Dominion Building. Supply of coal....	S. Cunard & Co..	July 12, 1902	1,120 27
" Ass't. Rec. Gen'ls' Office " ....	" .....	" 12, 1902	14 40
" Examining Warehouse " ....	" .....	" 12, 1902	187 91
" Immigrant Building " ....	Inter'nial Coal Mining Co.	" 12, 1902	182 12
" Ass't. Rec. Gen'ls' Office " ....	" .....	" 12, 1902	36 00
Kentville, Post Office " ....	Acadia Coal Co..	" 26, 1902	157 50
Liverpool " " ....	James Kenna.....	" 11, 1902	180 00
Lunenburg " " ....	James B. Young.....	" 11, 1902	212 69
Middleton, Armoury, Fittings.....	A. W. Allen & Son.....	June 19, 1903	1,450 00
" Heating system...	Crowe Bros .....	Feb. 24, 1903	1,750 00
New Glasgow, Post Office. Supply of coal....	Int'nial Coal Mining Co.	July 12, 1902	155 00
North Sydney " " ....	The Cape Breton Coal Mining Co. Ltd. ....	" 26, 1902	159 90
Pictou " " ....	Chas. W. Ives.....	" 16, 1902	214 81
" Custom House " ....	" .....	" 16, 1902	52 20
" Custom House & Post Office, Plumbing works &c.....	The Pictou Foundry & Machine Co.....	Aug. 26, 1902	2,110 10
Springhill, Post Office. Supply of coal.....	Cumb'land R'y & Coal Co.	July 18, 1902	282 89
Sydney " " ....	T. Routledge.....	" 16, 1902	124 00
Truro " " ....	Acadia Coal Co..	" 26, 1902	199 36
Windsor " " ....	M. H. Goudge & Son....	" 26, 1902	332 48
Yarmouth " " ....	James Kenna.....	" 11, 1902	
<i>Prince Edward Island.</i>			
Charlottetown, Post Office. Supply of coal.....	Augustus Down.....	" 8, 1902	517 89
Montague " " ....	Geo. Whitman.....	" 8, 1902	65 80
<i>New Brunswick.</i>			
Bathurst, Post Office. Supply of coal.....	Chas. Powell.....	Aug. 6, 1902	
" Public Building. Heating & Boiler...	R. E. Fitzgerald....	" 5, 1902	1,800 00
Chatham, Post Office. Supply of coal.....	John Russell & Co.....	July 8, 1902	252 50
Dalhousie " " ....	Chas. Powell.....	Aug. 6, 1902	144 98
Maryaville, Public Building. Heating apparatus	C. J. B. Simmons.....	Jan. 26, 1903	825 00
" " Inside fittings & concrete floors.....	" .....	March 24, 1903	1,360 00
Moncton, Post Office. Supply of coal.....	The Strathcona Coal Co.	July 7, 1902	274 85
Newcastle " " ....	John Russell & Co.....	" 8, 1902	339 31
Richibucto, construction of a P. office customs &c. building.....	James Reid.....	Nov. 25, 1902	9,716 00
St. John immigrant building. Supply of coal...	Vroom & Arnold.....	Sept. 5, 1902	592 23
" (North) post office " ....	R. P. & W. F. Starr....	July 7, 1902	1,088 39
" (West) " " ....	" .....	" 7, 1902	
" post office " ....	" .....	" 7, 1902	
" Saving bank " ....	" .....	" 7, 1902	374 66
" custom house " ....	" .....	" 7, 1902	2,080 25



## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
PUBLIC BUILDINGS— <i>Continued.</i>			\$ cts.
<i>New Brunswick—Concluded.</i>			
Sussex armoury. Fittings . . . . .	H. H. Dryden . . . . .	Aug 14, 1902	965 00
" " " " . . . . .	S. B. Lordly . . . . .	March 16, 1902	4,029 00
<i>Quebec.</i>			
Aylmer post office. Supply of coal . . . . .	Hull Coal Co. . . . .	July 18, 1902	217 00
Coaticook " " . . . . .	B. J. Smith . . . . .	Nov. 27, 1902	132 08
Farnham " " . . . . .	J. A. Lequin . . . . .	Aug. 7, 1902	42 00
Granby public building.—Heating apparatus . . . . .	Alex. MacKay & Co . . . . .	Dec. 16, 1902	1,080 00
" " fittings . . . . .	Neill & Kent . . . . .	March 2, 1903	2,650 00
Hull post office. Supply of coal . . . . .	Hull Coal Co. . . . .	July 9, 1902	279 70
Lachine " " . . . . .	Albert F. Dawes . . . . .	" 21, 1902	96 00
Laprairie " " . . . . .	J. B. H. Beauvais . . . . .	" 9, 1902	129 52
L'Assomption—Construction of post office &c., building . . . . .	Edmond Piché . . . . .	Dec. 1, 1902	10,150 00
Montreal post office—Alterations and additions to fittings . . . . .	J. B. Gratton . . . . .	Nov. 5, 1902	2,245 00
Montreal examining warrenhouse—Alterations to heating apparatus . . . . .	Pierre Leclerc, fils . . . . .	Dec. 18, 1902	2,250 00
Montreal examining warehouse fittings . . . . .	Précourt & Co. . . . .	Jan. 30, 1903	4,000 00
Quebec annex to iron foundry, cesspool, &c. . . . .	Dussault & Pageau . . . . .	Oct. 15, 1902	2,071 00
" artillery workshop, gallery . . . . .	Wm. Stuart . . . . .	" 19, 1902	800 00
" post office—Alterations and additions to fittings . . . . .	Fred. de Varennes . . . . .	Nov. 19, 1902	1,950 00
Quebec iron foundry—Heating apparatus . . . . .	O. Picard & fils . . . . .	Dec. 18, 1902	1,190 00
" post office building. Supply of water . . . . .	Corporation of City of Quebec . . . . .	" 27, 1902	750 00
" custom house " . . . . .	" " . . . . .	" 27, 1902	800 00
" examining warehouse " . . . . .	" " . . . . .	" 27, 1902	450 00
" marine building " . . . . .	" " . . . . .	" 27, 1902	750 00
" artillery workshop—Shafting for transmission of power . . . . .	Carrier Lainé & Co. . . . .	March 7, 1903	1,879 00
Quebec artillery workshop—Electric light-wiring and fittings . . . . .	Slade Electric Co. . . . .	April 1, 1903	442 00
Rimouski post office. Supply of coal . . . . .	H. G. Lepage . . . . .	July 14, 1902	276 36
St. Hyacinthe " " . . . . .	C. Rouleau & Fils . . . . .	" 15, 1902	292 35
St. Johns " " . . . . .	Jules Audette . . . . .	Sept. 2, 1902	
Sorel " " . . . . .	Adolphe Plante . . . . .	July 16, 1902	
Three Rivers, retaining wall . . . . .	Télesphore Dugré . . . . .	Nov. 25, 1902	4,999 00
Valleyfield post office. Supply of coal . . . . .	Victor Léger . . . . .	" 11, 1902	12 00
Victoriaville " " . . . . .	Ferdinand Beauchesne . . . . .	July 11, 1902	220 63
<i>Ontario.</i>			
Amherstburg post office. Supply of coal . . . . .	Falls Bros. . . . .	July 10, 1902	26 65
Arnprior " " . . . . .	J. S. Moir . . . . .	" 16, 1902	
Barrie " " . . . . .	Mickle Dymont & Son . . . . .	" 11, 1902	248 88
Belleville " " . . . . .	C. C. Leavens . . . . .	" 11, 1902	480 00
Berlin " " . . . . .	R. Boehmer & Co . . . . .	" 11, 1902	260 26
" " alterations and additions . . . . .	R. Bowman . . . . .	May 13, 1903	7,316 00
Brantford " Supply of coal . . . . .	Thomas Elliot . . . . .	July 11, 1902	345 53
Brockville " " . . . . .	Central Canada Coal Co. . . . .	" 10, 1902	344 00
Cayuga " " . . . . .	A. J. Grant . . . . .	" 21, 1902	89 10
Clinton—Construction of a post office building . . . . .	S. S. Cooper . . . . .	" 28, 1902	9,500 00
" post office. Heating apparatus . . . . .	Martel & Langelier . . . . .	March 19, 1903	1,150 00
" " Plumbing works . . . . .	S. S. Cooper . . . . .	June 22, 1903	700 00
Cobourg " Supply of coal . . . . .	Downy Coal Co. . . . .	July 21, 1902	210 00
Deseronto public building—Stone fence, gates, granolithic sidewalks . . . . .	Richard Sheehy . . . . .	Sept. 13, 1902	2,000 00
" post office. Supply of coal . . . . .	The Rathbun Co. . . . .	July 11, 1902	250 00
" public building. Heating apparatus . . . . .	Pierre Leclerc, fils . . . . .	Oct. 17, 1902	1,750 00
" " Fixtures . . . . .	Robert Sheehy . . . . .	Feb. 5, 1903	2,800 00
" " Tower clerk . . . . .	Geo. E. Snider . . . . .	June 1, 1903	1,325 00



3-4 EDWARD VII., A. 1904

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.		Names of Contractors.	Date of Contract.		Amount.
					\$ cts.
PUBLIC BUILDINGS—Continued.					
Ontario—Concluded.					
Dundas post office.	Supply of coal....	Thos. Myles & Sons. ....	July	8, 1902	23 40
" armoury.	Fittings.....	Jos. Bowman & Co.....	Feb.	28, 1903	1,330 00
" drill hall.	Veneering and flooring	" .....	April	23, 1903	5,750 00
Fort Williams, construction of a public building.		Robert Cameron.....	July	22, 1902	20,400 00
Galt post office.	Supply of coal.....	A. J. Colvin .....	"	11, 1902	203 50
Gananoque post office.	" .....	C. E. Britton.....	"	8, 1902	.....
" custom house.	" .....	" .....	"	8, 1902	.....
Goderich post office.	" .....	Wm. Lee.....	"	10, 1902	160 82
" "	Plumbing works...	J. H. Worsell.....	Jan.	15, 1903	337 00
Guelph "	Supply of coal.....	Kloepfer & Co.....	July	10, 1902	145 83
" additions and alterations to post office....		John Kennedy.....	March	28, 1903	30,595 00
Hamilton post office.	Supply of coal.....	Thomas Myles & Sons...	July	8, 1902	966 00
Kingston "	" .....	P. Walsh.....	"	9, 1902	310 50
" custom house	" .....	" .....	"	9, 1902	258 80
" R. M. College.	Wiring .....	Breck & Halliday.....	"	14, 1902	300 00
" R.M.C. Gymnasium.	Heating apparatus	McKelvey & Birch.....	Sept.	19, 1902	676 00
" Gymnasium.	" .....	" .....	March	19, 1903	1,910 00
" "	Wiring and fixtures.	Breck & Halliday.....	"	15, 1903	575 00
Lindsay post office.	Supply of coal.....	The Rathbun Co. ....	July	11, 1902	170 42
London "	" .....	Bowman & Co.....	"	7, 1902	959 70
" custom house	" .....	" .....	"	7, 1902	332 27
" construction of a drill hall... ..		Sullivan & Langdon.....	Dec.	6, 1902	133,897 00
Napanee post office.	Supply of coal.....	F. E. Van Luven. ....	July	21, 1902	250 00
Niagara "	" .....	John E. Hutchings.....	"	11, 1902	146 23
Orangeville post office.	" .....	J. R. Lathwell... ..	"	17, 1902	156 50
Orillia "	" .....	Andrew Tait .. ..	"	14, 1902	164 40
Ottawa public buildings.	" .....	John Heney & Son.....	May	13, 1902	41,470 22
" experimental farm.	" .....	McCullough & Co.....	July	11, 1902	1,136 72
" publi : building.	Supply of millwood	W. C. Edwards & Co.Ltd	"	14, 1902	(p.cord) 1 60
" construction of astronomical observatory-					
exp. farm .....		Théophile Viau.....	Aug.	28, 1902	74,999 00
" post office building—Elec. passeng. elevator		The Turnbull Elev.Mf.Co	Feb.	3, 1903	5,310 00
" " Current for operat. of elevator.		The Ottawa Elec. Co....	March	24, 1903	(p.an) 300 00
" public bldgs. and offices.	Supply of ice..	J. O. Charlebois & Co...	June	24, 1903	(p. 100 lbs) 20
Pembroke post office.	Supply of coal.....	Dunlop & Co.....	July	18, 1902	191 20
Peterborough "	" .....	The McClennan Co.....	"	11, 1902	539 21
Pictou "	" .....	The Rathbun Co.....	"	11, 1902	190 00
Port Arthur "	" .....	Louis Walsh Coal Co....	"	22, 1902	176 00
Port Colbourne public building.	Heating appartus	Keith&FitzsimmonsCoL'd	Nov.	5, 1902	395 00
Port Hope post office.	Supply of coal.....	Wright & Rosevear...	July	5, 1902	236 80
Prescott "	" .....	James Buckly .....	"	16, 1902	.....
" custom house.	" .....	" .....	"	16, 1902	.....
St. Thomas post office	" .....	Ellison & Lewis.....	"	16, 1902	283 50
Sarnia public building.	Heating apparatus.	Alex. Mackay & Co....	April	6, 1903	1,800 00
" "	Improvements .....	Geo. A. Proctor.....	"	4, 1903	4,042 00
Smith's Falls post office.	Supply of coal .....	A. Foster.....	July	16, 1902	149 50
Stratford "	" .....	John E. Hutchings.....	"	11, 1902	374 87
Strathroy "	" .....	Alex. Reed.....	"	16, 1902	191 22
Toronto "	" .....	The Elias Rogers Co....	"	16, 1902	1,230 49
" Custom House	" .....	" .....	"	16, 1902	385 05
" Ex'g Warehouse	" .....	" .....	"	16, 1902	1,049 89
" Revenue Office	" .....	" .....	"	16, 1902	155 93
" Post Office. Additions & alterations to.		David Carlyle .. .	Nov.	26, 1902	21,949 00
" Postal Station "C" Heating Apparatus		Harrison & Robertson...	Jan.	13, 1903	986 00
" " " Wiring and Fixtures		The Keith & Fitzsimmons			
		Co. Ltd .....	March	10, 1903	285 00
Toronto Junction. Construc. of a Post Office Bldg.		Joy & Needham.....	May	29, 1903	23,450 00
Trenton Post Office.	Supply of coal.....	J. Funnell .....	July	16, 1902	129 56
Windsor "	" .....	F. X. Scully .....	"	19, 1902	398 75
" " Tile floor in lobby.....		Enc. Jacques. ....	Dec.	24, 1902	725 00
Woodstock "	Supply of coal.....	Frank Frank .....	July	19, 1902	288 00



## SESSIONAL PAPER No. 19

No. 1—CONTRACTS let by the Department of Public Works &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
			\$ cts.
PUBLIC BUILDINGS— <i>Concluded.</i>			
<i>Manitoba.</i>			
Brandon Post Office. Supply of coal....	Robert Purdon.....	July 14, 1902	681 90
" Expl. Farm. " .....	" .....	" 14, 1902	192 61
Portage la Prairie, Public Building " .....	G. B. Housser & Co. ....	" 15, 1902	744 81
Winnipeg, Imm. office and shed " .....	Windatt & Co. ....	" 29, 1902	420 00
" Indian Office & Crown T. Office " .....	Taylor & Sons.....	" 29, 1902	380 80
" Custom Office " .....	Harstone Bros.....	" 29, 1902	702 88
" Post Office " .....	" .....	Aug. 5, 1902	1,994 82
" Ex'g. Warehouse " .....	D. E. Adams .....	" 5, 1902	378 32
<i>North West Territories.</i>			
Carnduff, Court House. Heating Apparatus	T. & R. Cotter.....	Jan. 30, 1903	1,078 00
" " Fittings .....	T. M. Harrington & Co..	April 16, 1903	269 00
Edmonton, Construction of a jail .....	Chas. May.....	June 25, 1903	50,150 00
" Dominion Land. Supply of coal....	Milner & Blatchford....	Aug. 20, 1902	180 00
Indian Head, Experimental Farm " .....	Geo. Thompson.....	Sept. 22, 1902	
Macleod, Court House " .....	Geo. Skelding. ....	July 15, 1902	56 96
" Custom House " .....	" .....	" 15, 1902	119 94
" Construction of a Court House.....	Patrick Navin .....	Oct. 8, 1902	13,973 60
Moose Jaw, Court House. Heating Apparatus.	Cotter Bros. ....	Nov. 8, 1902	525 00
" " Supply of Coal ...	R. Beard .....	July 21, 1902	132 00
Regina, " " .....	Rembler Paul .....	" 14, 1902	531 25
do Dominion Land " .....	" .....	" 14, 1902	476 25
do Post Office " .....	" .....	" 14, 1902	256 25
Wolseley, Court House " .....	Magee & Thompson.....	Aug. 20, 1902	219 17
Yorkton, Construction of Court House ...	Thomas Fulton .....	Oct. 4, 1902	8,760 00
" Immigrant Building. Supply of coal....	Wm. Simpson.....	Sept. 12, 1902	136 86
<i>British Columbia.</i>			
Kamloops, Drill Shed. Heating apparatus.	Jas. M. Benzie.....	Jan. 19, 1903	365 00
Kaslo, " Installation of lights.	Kootenay Elec. Co. Ltd..	Sept. 22, 1902	170 90
" " Additional works....	D. J. McLachlan. ....	Aug. 2, 1902	590 00
" " Fittings & Furniture.	Kennedy & Burden....	June 12, 1903	525 00
Nelson, Public Building. Heating Apparatus.	R. Jas. Nott.....	Dec. 8, 1902	1,875 00
" Drill Shed. do .....	Frank E. Hebden. ..	Jan. 15, 1903	215 00
" Post Office &c. Building. Fittings...	T. Viau & Chs. Lemoine.	" 29, 1903	4,400 00
Rossland, Post Office &c. Building Fittings..	T. Viau & Chs. Lemoine.	Jan. 29, 1903	4,950 00
Williams, Head Quar. Station, Engine Dynamo &c. for lighting....	Ahearn & Soper Ltd. ....	Aug. 15, 1903	11,313 00
HARBOURS AND RIVERS.			
<i>Nova Scotia</i>			
Descousse, construction of wharf and warehouse.	Wm. J. Landry .....	Mar., 28, 1903	4,388 00
Drum Head, " breakwater.....	W. Suttis & A. Fleming..	Nov. 13, 1902	4,865 00
Fort Lawrence " pile wharf.....	J. J. Lyons & J. White..	June, 2, 1903	14,895 00
Green Cove " breakwater.....	Hugh McDonald.....	Feb. 4, 1903	6,475 00
Herring Cove " public brakewater....	D. W. B. Reid & L. Archibald.....	" 16, 1904	11,475 00
Larry's River " brakewater.....	D. W. B. Reid & L. Archibald.....	Sept. 22, 1902	15,840 00
Port Hawkesbury, reconstruction and extension of Long wharf: .....	S. O'Donohue & Girroir..	" 11, 1902	9,450 00
Sandy Cove, construction of public breakwater.	Hayden & Oliver.....	Feb. 12, 1903	13,000 00
South Bay—Ingonish, construction of public wharf	Hugh McDonald.....	" 28, 1903	2,485 00
Tiverton, construction of public breakwater..	Hayden & Oliver.....	" 12, 1903	17,000 00
Washabuck Centre, construction of wharf and road	Hugh McDonald.....	Apl. 6, 1903	5,860 00



3-4 EDWARD VII., A. 1904

No. 1—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract	Amount.
			\$ cts.
HARBOURS AND RIVERS.— <i>Concluded.</i>			
<i>Prince Edward Island.</i>			
Cove Head, construction of shear dam.....	Alex. & W. Compton....	March. 12, 1903	6,699 00
St. Peters, construction of new block at breakwater	Robert N. Cox.....	Sept. 26, 1902	2,450 00
<i>New Brunswick.</i>			
Hopewell Cape, construction of approach and roadway to pier . . . . .	Downey & Lynds.. . . .	Feb. 9, 1903	900 00
Oromocto, construction of wharf. . . . .	Gel. A. Appleby.....	Jan. 22, 1903	6,200 00
Upper Salmon river, extension of breakwater....	A. E. Smye, & M. Alcorn	Aug. 6, 1902	4,964 00
<i>Quebec.</i>			
Cross Point, construction of a wharf. . . . .	Lachance & Co . . . . .	March. 20, 1903	9,995 00
Levis Graving Dock, supply of water . . . . .	C. F. Langlois... . . .	July, 27, 1902	p. year 42 00
Pointe a Paquin, River St. Maurice, supply of timber for jam piers . . . . .	O. Desaulniers.....	March, 6, 1903	5,515 00
Pointe St. Pierre—Gaspé, construction of breakwater . . . . .	J. Heney & H. Smith... .	Sept. 4, 1902	22,000 00
Portage du Fort, masonry and roadway appr. of the bridge.....	Thos. Moran . . . . .	June, 22, 1903	10,797 00
Quebec, improvements in harbour.....	Dussault & Lemieux....	May, 8, 1903	198,700 00
Richmond, Riv. St. François, construction of 4 ice piers.....	Wm. Ross.....	Dec. 27, 1902	11,317 00
Rivière au Renard, additional length to wharf...	J. J. Lyons & J. White..	June, 2, 1903	41,485 00
St. François, Isld. of Orleans, isolated Block....	The W. J. Poupore Co. Ltd	Feb. 7, 1903	11,800 00
St. Irénée, addition to wharf.....	Nap. Trudel. . . . .	Jan. 24, 1903	10,399 00
<i>Ontario.</i>			
Blind River, construction of pile wharf.....	Robert Grant.....	Feb. 11, 1903	9,310 75
Burk's Falls, " wharf.....	David Conroy.....	Jan. 2, 1903	5,400 00
Collingwood Harbour, deepening . . . . .	C. S. Boone.....	Aug. 29, 1902	35,693 00
Huntsville, construction of pile wharf . . . . .	Geo. Hutcheson.....	" 22, 1902	2,770 00
" additional work to pile wharf... . .	" . . . . .	Feb. 17, 1903	320 00
Orillia, construction of wharf. . . . .	Green & MacKinnon....	Jan. 12, 1903	8,389 00
Owen Sound Harbour, dredging.....	A. F. Bowman... . . .	Sept. 5, 1902	24,210 00
Point Pelee Island, extension to wharf.....	A. M. McCormick & Son	Dec. 15, 1902	3,500 00
Port Arthur dredging.....	C. S. Boone.....	March 5, 1903	(p.hr.) 10 00
Sturgeon Falls—Construction of wharf.....	Robert Grant.....	Jan. 23, 1903	2,810 00
VESSELS, DREDGES AND PLANT.			
Construction of a locomotive boiler for dredge 'Queen' . . . . .	Powers & Co... . . . .	Aug. 23, 1903	1,200 00
" buckets for dredge 'St. Lawrence.'	The Pictou Foundry & Machine Co . . . . .	Feb. 3, 1903	1,872 00
" a marine return tubular boiler for tug 'Delisle'.....	Powers & Co.. . . . .	" 16, 1903	2,525 00
" a marine return tubular boiler for tug 'Ottawa.'.....	" . . . . .	May 4, 1903	1,700 00
" air pump and condenser for dredge 'Progress,' . . . . .	Wheeler Condenser and Engineering Co.....	" 1, 1903	1,580 00
" air pump and condenser for tug 'Monitor.'.....	J. & R. Weir . . . . .	" 1, 1903	1,480 00
" bow and stern cable winches for dredge 'J. Israel Tarte.'....	The Polson Iron Works..	" 12, 1903	5,700 00
Electrical plant for swinging the govt. bridge—Burlington channel.....	McLachlan Joy Electric Co . . . . .	" 18, 1903	2,040 00



## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
TELEGRAPHS.			\$ cts.
Mabou to Port Hawkesbury, N.S.—Construction of a telegraph line . . . . .	Ronald McInnes . . . . .	Aug. 27, 1902	p.mile 40 00
150-Mile House to Quesnelle <i>via</i> Horsefly, B.C.—Construction of a telegraph line . . . . .	James B. Shields . . . . .	" 30, 1902	" 69 00
St. Peters to Port Hawkesbury, N.S.—Construction of a telegraph line . . . . .	Murdoch Cameron . . . . .	Sept. 6, 1902	" 50 00
" Main-à-Dieu, &c., &c., N.S.—Construction of a telegraph line . . . . .	Ahearn & Soper Ltd . . . . .	Oct. 3, 1902	18,625 00
Magdalen Islands to Anticosti & Bryon Islands 116 knots deep sea gutta percha cable . . . . .	Henley's Telegraph Wks Co. of London, England	Dec. 16, 1902	60,436 00
Magdalen Islands to Anticosti & Bryon Islands 1 knot of special armoured cable . . . . .	Henley's Telegraph Wks Co. of London, England	" 16, 1902	1,200 00

J. A. CHASSÉ,  
*Law Clerh.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, December 5, 1903.



Date of Conveyance.	Vendors.	Purchasers.	Description of Property.	For what purpose.	Area.	Price.
1902						\$ cts.
July 25.....	The South Shore R.R. Co.	His Majesty	Land and wharf part of lot No. 1, Sorel, P. Q.	For wharf	400 x 2,063 ft.	1,000 00
Aug. 8.....	His Majesty	Are. McPhee	Land and premises lot No. 38, 3rd concession Township of Lechiel, Alexandria, Ont.	Private enterprise	100 acres.	2,800 00
" 11.....	A. M. Nanton & J. H. Manson	His Majesty	Lots No. 9 to 29, Block 18, Red Deer, N.W.T.	Site for court house.	1 1/3 of an acre	830 00
Sept. 2.....	Nellie Fisher Eddy.	"	Land at Blind River, Algoma, Ont.	Appr. to wharf.	1 1/3 of an acre	350 00
" 4.....	Donald Kempt & Uxor	"	Strip of land between public road and shore of Great Bras d'Or—Kempt Head, N.S.	"	18,800 sqr. ft.	50 00
" 10.....	Maganetawan River Ry Co. & Maganetawan Tanning & Electric Co.	"				
Apr. 19.....	H. Knight Bros. Co.	"	Part lot No. 10, subdivision of lot No. 4, 9th concession, Township of Armour, Burk's Falls, Ont.	"	1 1/16 of an acre.	1 00
June 30.....	The Muskoka & Georgian Navigation Co. Ltd.	"	Part of lot No. 4, 9th Concession, Armour Township, Burk's Falls, Ont.	Appr. to wharf.	1 3/16 of an acre.	1 00
Sept. 15.....	John E. Stocker	"	Land—Oromocto, N. B.	"	1 1/16 of an acre.	1 00
" 20.....	J. T. Ross & al.	"	Part of lot No. 23, N. side of Main St., Hamilton, Ont.	For wharf	5 5/16 acre.	250 00
Oct. 1.....	North American Bent Chair Co.	"		Gov. purposes.	12 1/2 perches.	9,000 00
" 23.....	Eliza Torrey	"	Land part of lot 12, Owen Sound, Ont.	Harbour improvements	3 1/16 acre	400 00
Nov. 18.....	Jas. Dempsey & ux.	"	Land at Guysboro' N.S.	Site for pub. bldg.	15,537 ft.	800 00
" 20.....	J. Arsenau & al.	"	Land at Herring Cove, N.S.	Site for wharf.	1,200 sqr. ft.	1 00
Dec. 6.....	The Hudson Bay Co.	"	Land at Ruisseau LeBlanc, P.Q.	Road to wharf	5,000 ft.	2 00
" 18 ..	Ph. Morrison & uxor.	"	Lots 11, 12, 13, 14—Block 3, Winnipeg, Man.	For pub. bldg.		3,000 00
1903			Land between pub. road and shore of Great Bras d'Or channel—Boularderie Isld., N.S.	Appr. to wharf	18,800 sqr. ft.	50 00
Jan. 7.....	S. S. Scott & W. G. Robertson.	"	Sale of SS. <i>Tyrian</i> .	Gov. purposes.		20,000 00
" 20.....	Robert Johnston.	"	Lots Nos. 78 and 100—Valleyfield, P.Q.	Site for pub. bldg.		10,000 00
" 27.....	A. Faulkner & ux.	"	Parcel of land—Faulkner's Creek, N.S.	For wharf	1 1/2 of an acre.	60 00
" 29.....	Neil P. McLean & ux.	"	Parcel of land—Washabuck Centre, N.S.	"	9,550 sqr. ft.	1 00
Feb. 3.....	Fabrique St. Mathias, Q.	"	Lot No. 57, St. Mathias, P.Q.	"	5,200 sqr. ft.	Donation
" 23.....	J. F. Guité.	"	Lots Nos. 47 and 48; 1st Range, Maria Township, P.Q.	"	26,500 sqr. ft.	entre vifs.
" 23.....	R. Arseneau & al.	"	Land, 1st Range, Township of Hamilton, Ruisseau LeBlanc, P.Q.	For road to wharf.		1 00
						3 00



SESSIONAL PAPER No. 19

No. 2.—STATEMENT of properties purchased or sold, &c.—*Concluded.*

Date of Conveyance.	Vendors.	Purchasers.	Description of Property.	For what purpose.	Area.	Price.
1903						\$ cts.
Mar. 19...	F. Landry & al.....	His Majesty	Land at D'Escouse, N.S. ....	For wharf .....	15,840 sqr. ft.....	200 00
" 19....	Thos. D. Morrison & al .....	"	" .....	" .....	15,023 sqr. ft.....	100 00
" 21....	J. & R. Weir.....	"	Sale of steel tug <i>Monitor</i> .....	Gov. purposes.....	.....	12,500 00
" 30....	Sam. Clarke & ux.....	"	Town lots 7 & 15, block "C" Cobourg, Ont.....	For armoury.....	16,936 sqr. ft.....	4,000 00
" 31....	John Hodgson & ux or.	"	Land at Drum Head, N.S.....	Appr. to wharf.....	8,200 superficial ft ..	25 00
Apr. 2 ...	Govt. of Nova Scotia...	Federal Gov.	Water lot at l'Ardoise, N.S .....	For wharf.....	.....	Transfer
" 11....	Wm. Brown.....	His Majesty	Part of lot No. 37, Pointe Fortune, P.Q.....	" .....	18,039 ft.....	1,000 00
" 24....	C. A. Gillis & al. ....	"	Land at West Bay "The Points" N.S.....	" .....	32,185 sqr. ft.....	15 00
" 29 ...	John McMillan & ux..	"	Land & land covered with water, Isaac's Harbour, N.S ..	" .....	1 <sup>1</sup> / <sub>6</sub> of an acre.....	400 00
May 1....	Catherine Garvin.....	"	Lots 279, 280, 281—Kingston, Ont .....	For Field Battery .....	.....	5,000 00
" 5....	Corporat'n of Barrie, O.	"	Land & premises, foot of Bayfield St., Barrie, Ont. ..	Public bldg.....	6 <sup>0</sup> / <sub>100</sub> acre.....	1 00
" 19....	M. Delaney. ....	"	Sale of tug <i>C. S. Parnell</i> .....	Gov. purposes.....	.....	1,800 00
" 19....	B. F. Kenney & ux....	"	Land and land covered with water, Indian Brook, N.S....	" .....	.....	150 00
" 19....	Municipality of Percé, P.Q.....	"	Parts of lots 452, 455 & 457, Percé, P.Q.....	For wharf.....	.....	Free Grant
June 5....	D. E. Larose & al.....	"	Sale of lot No. 314, Thetford Mines, P.Q .....	Public bldg. ....	5,000 ft. ....	1,800 00
" 20....	Corporat'n of Bowmanville, Ont.....	"	Southerly 100 ft. of lot 39, Block "M" Bowmanville, Ont	" .....	6,600 ft.....	5,000 00



No. 3.—STATEMENT of properties leased to and by the Department of Public Works during the Fiscal Year ended June 30, 1903.

Date	Lessors.	Lessees.	Property Leased.	For what purpose.	Duration of Lease.	Annual Rental.
1902.						
July 1	His Majesty	A. J. Green	Building—Ouellette and Chatham streets, Windsor, Ont.	Private enterprise	1 year	\$100 00 per annum
Sept. 20	"	Gowrie & Block House Collieries, Ltd.	Water lot, westward of Gov. pier, Port Morien, N.S.	"	65 "	1 00 " "
1903.						
March 7	C. Hiebert	His Majesty	Building at Didsbury, N. W. T.	Lunng. purposes.	6 months	13 33 $\frac{1}{3}$ p. month
" 9	Thistle Estate	"	Rooms in 'Thistle Bldg.' Ottawa.	Chf. Astronomer	1 year	800 00 per annum
" 22	L. B. Matusch.	"	Building at Ponoka, N. W. T.	Lunng. purposes	1 year	100 00 "
" 28	Wm. Bristow	"	Port'n of Bldg at Grenfell, N. W. T.	"	6 months	8 00 per month
April 13	N. A. Rogstad.	"	House at Metaskiwin, N. W. T.	"	1 year	100 00 per annum
" 27	A. H. Woodman	"	Building at Prince Albert, N. W. T.	"	4 months	10 00 per month
May 1	James Walker	"	Ground floor 'Walker Bldg.' St. John, N.B.	For Militia	1 year	300 00 per annum
" 1	Martha Horton	"	Premises No. 55, Metcalfe street, Montreal, P.Q.	Post Office Dept	1 year	300 00 "
" 3	His Majesty	H. A. Gray.	Land & prem.—Toronto Harb. Ont	"	5 years	1 00 "
June 1	"	Parks Committee of Kingston	Land between P. O. & Cust. H. Kingston, Ont.	"	During pleasure	1 00 "

DEPARTMENT OF PUBLIC WORKS,  
December 5, 1903.

J. A. CHASSÉ  
*Law Clerk.*



LIST

OF SOME OF THE

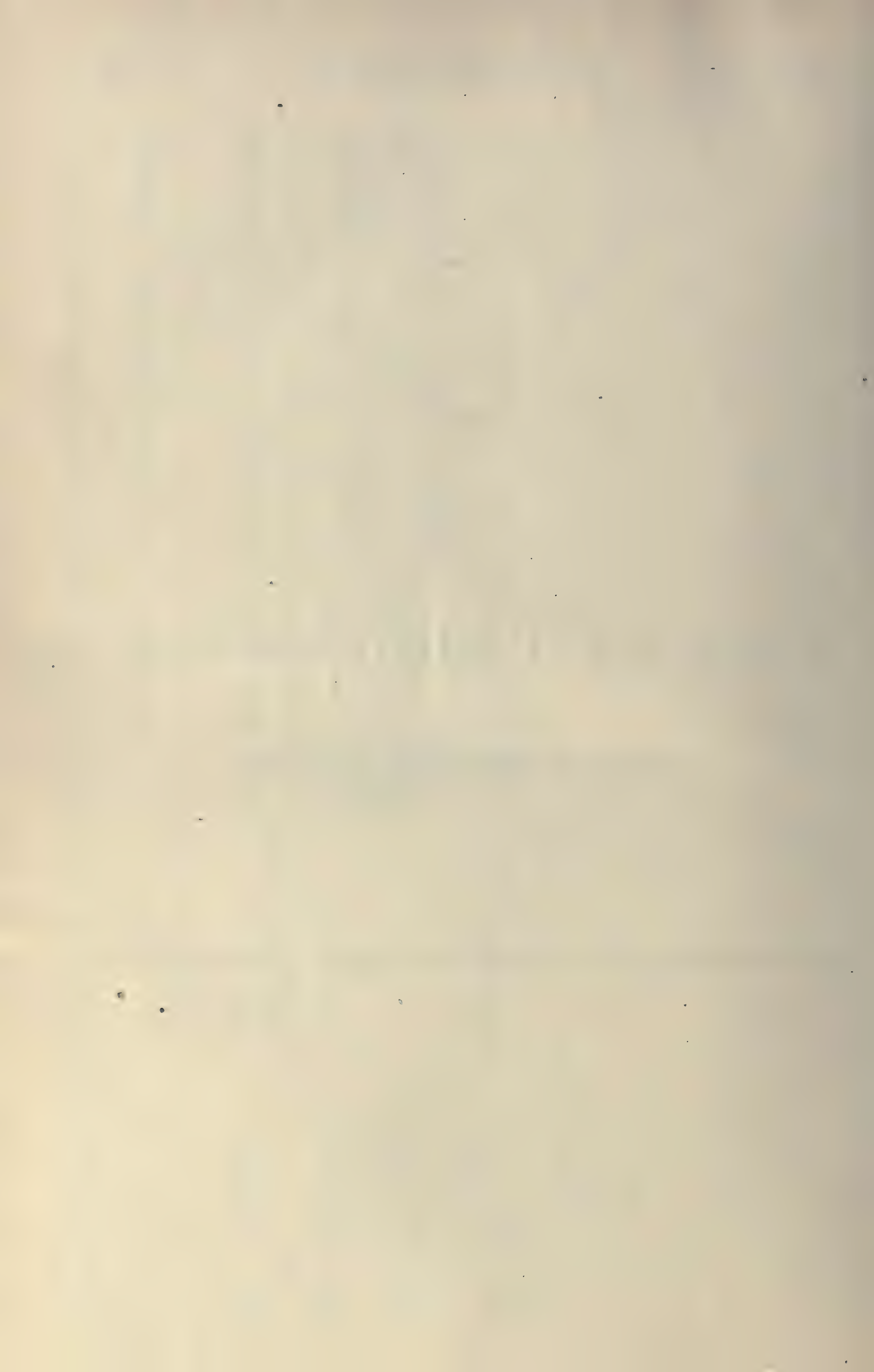
ACTS OF PARLIAMENT

PASSED AT THE SESSION OF 1903

HAVING REFERENCE TO THE

DEPARTMENT OF PUBLIC WORKS OR WORKS UNDER ITS CHARGE







LIST of some of the Public Acts of the Parliament of Canada, passed at the Third Session of the Ninth Parliament, closed by Prorogation on October 24, 1903, and having reference to the Public Works Department or works under its charge (3 Edward VII).

Subject.	Full Title of the Statute.	Chapter.	Page in Statute Book.
Sums granted to His Majesty for the financial years ending June 30, 1903, and June 30, 1904, and the purposes for which they are granted.	An Act for granting to His Majesty certain sums of money for the public service of the financial years ending respectively the 30th June, 1903, and the 30th June, 1904.....	2	11
Respecting the Civil Service.	An Act to amend the Civil Service Act..	9	113
Respecting Civil Service Superannuation Act.	An Act to amend the Civil Service Superannuation Act.....	10	121
Respecting Subsidy for construction of Dry Docks.	An Act respecting the encouragement of the construction of Dry Docks.....	17	149
Respecting Expropriation Act.	An Act to amend The Expropriation Act.....	22	161
Respecting advances to Harbour Commissioners of Montreal.	An Act to provide for further advances to the Harbour Commissioners of Montreal.....	36	197
Respecting Public Works Act.	An Act to amend the Public Works Act.....	52	249

*N.B.—Upper Ottawa Improvement Company, Limited.*—A schedule of tolls to be charged by said company in connection with the improvements of their works for the season of 1903, was approved by an Order in Council passed on the 25th of February, 1903.

*Rouge Boom Company of Calumet, Limited.*—A schedule of tolls to be charged by said company in connection with the improvements of their works for season 1903, was approved by an Order in Council passed on the 17th of March, 1903.

*French River Boom Company, Limited, of Toronto, Ontario.*—A schedule of tolls to be charged by said company for the use of their works during the season of 1903, was approved by an Order in Council passed on the 14th of April, 1903.

J. A. CHASSÉ,  
*Law Clerk.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, December 5, 1903.







# NATIONAL ART GALLERY

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## CURATOR'S REPORT

FOR THE FISCAL YEAR ENDED JUNE 30, 1903.







## NATIONAL ART GALLERY.

OTTAWA, January 14, 1904.

FRED GELINAS, Esq.,  
Secretary,

SIR,—I have the honour to report that the following additions have been made to the National Art Gallery of Canada during the fiscal year ending June 1903.

Oil paintings :—

—“ The Mendicant ” by E. Dyonnet, Esq., R.C.A.

“ St. Andrews, N. B. ” by William Hope, Esq., R. C. A., presented by the Royal Canadian Academy. “ Under the Willows ” by G. Horn Russell, presented by Miss Caroline Hile of Ottawa.

The following pictures were purchased by the Government :—“ The Peddler ” by H. Tenkate for the sum of twelve hundred and fifty dollars (\$1,250.00).

“ Vintage in Champagne ” by Emile Baron.

“ Watering Horses ” by G. Calves.

“ The Cavalry Charge ” by H. Chartier.

“ C'est toujours la même Chanson ” by Paul Guillet.

“ The Abandoned Corner ” by Hermann.

“ Le Gynécée ” by G. Rochegrosse.

“ The Ambuscade ” by H. C. Roy.

The cost of these seven pictures was five thousand two hundred and fifty dollars (\$5,250.00).

Ten thousand four hundred and fifty-one (10,451) visitors registered during the year.

The Gallery was closed to the public during the month of July on account of repairs and again from April 1 to May 15, during the Exhibition of the Royal Canadian Academy.

I have the honour to be, sir,

Your obedient servant,

L. FENNINGS TAYLOR,  
*Curator National Art Gallery.*







NAMES OF THE CHIEF OFFICERS  
OF THE  
DEPARTMENT OF PUBLIC WORKS  
WITH  
DATES OF APPOINTMENT, ETC., FROM 1841 TO 1903







NAMES OF THE CHIEF OFFICERS.

The names with the dates of the appointment, &c., of the principal Officials of the Department of Public Works, from 1841 to 1903.

Names.	Capacity or Office.	Date of Appointment.			
		From	To		
<i>Under Statute 4-5 Vic., Cap. 38.</i>					
CORPORATION BOARD OF WORKS.					
Killaly, Hon. H. H.....	Chairman.....				
Daly, Hon. D.....	Members.....	Dec.	29, 1841		
Harrison, S. B.....				Oct.	3, 1844
Sullivan, R. B.....					
Davidson, J., Esq.....					
Begly, Thomas A.....	Aug.	17, 1841			
Keefer, Samuel.....	Chief Engineer.....	"	17, 1841		
Rubidge, F. B.....	Architect and Assistant Chief Engineer.....	Dec.	15, 1841		
NEW BOARD OF WORKS.					
Killaly, Hon. H. H.....	Chairman.....				
Daly, Hon. D.....	Members.....	Oct.	4, 1844		
Draper, Hon. W. H.....				June	8, 1846
Morris, Hon. W.....					
Papineau, Hon. D. B.....					
<i>Under Statute 9th Vic., Cap. 37, &amp;c.</i>					
Robinson, Hon. W. B.....	Chief Commissioner.....	June	22, 1846	March	10, 1848
Taché, Hon. E. P.....	".....	March	11, 1848	Nov.	26, 1849
Chabot, Hon. J.....	".....	Dec.	13, 1849	March	31, 1850
Merritt, Hon. W. H.....	".....	April	8, 1850	Feb.	11, 1851
Bourret, Hon. J.....	".....	Feb.	12, 1851	Oct.	27, 1851
Young, Hon. John.....	".....	Oct.	28, 1851	Sept.	22, 1852
Chabot, Hon. J.....	".....	Sept.	23, 1852	Jan.	26, 1855
Lemieux, Hon. F.....	".....	Jan.	27, 1855	Nov.	25, 1857
Alleyn, Hon. C.....	".....	Nov.	26, 1857	Aug.	1, 1858
Holton, Hon. L. H.....	".....	Aug.	2, 1858	"	6, 1858
Sicotte, Hon. L. V.....	".....	"	7, 1858	Jan.	10, 1859
Rose, Hon. John.....	".....	Jan.	11, 1859	June	12, 1861
Cauchon, Hon. Jos.....	Commissioner.....	June	13, 1861	May	23, 1862
Tessier, Hon. U. J.....	".....	May	24, 1862	"	27, 1863
Drummond, Hon. L. T.....	".....	"	28, 1863	July	23, 1863
Laframboise, Hon. M.....	".....	July	24, 1863	March	29, 1864
Chapais, J. C.....	".....	March	30, 1864	June	30, 1867
Casgrain, Hon. Chas. Eus.....	Second Commissioner.....	July	9, 1846	Feb.	29, 1848
Cameron, Hon. M.....	Assistant Commissioner.....	March	11, 1848	"	1, 1850
Wettenhall, James, Esq.....	".....	Feb.	2, 1850	April	16, 1850
Bourret, Hon. Jos.....	".....	April	17, 1850	Feb.	11, 1851
Killaly, Hon. H. H.....	".....	Feb.	12, 1851	May	6, 1859
Keefer, Samuel.....	Deputy Commissioner.....	May	6, 1859	March	7, 1864
Trudeau, Toussaint.....	".....	March	8, 1864	May	29, 1868
Begley, Thos. A.....	Secretary.....	Feb.	10, 1841	Oct.	31, 1858
Trudeau, Toussaint.....	".....	Dec.	13, 1859	March	7, 1864
Braun, Frederick.....	".....	March	8, 1864	July	1, 1867
Page, John.....	Chief Engineer.....	Oct.	31, 1873	Oct.	1, 1879



3-4 EDWARD VII., A. 1904

The names with the dates of the appointment, &c., of the principal Officials of the Department of Public Works, from 1841 to 1903—*Concluded.*

Names.	Capacity or Office.	Date of Appointment.			
		Served			
		From		To	
<i>Under Statute 31 Vic., Chap. 12.</i>					
McDougall, Hon. Wm.....	Minister.....	July	1, 1867	Dec.	7, 1869
Langevin, C.B., Hon. Hector L.....	" .....	Dec.	8, 1869	Nov.	6, 1873
Mackenzie, Hon. Alexander .....	" .....	Nov.	7, 1873	Oct.	16, 1878
Tupper, C.B., K.C.M.G., Sir Charles.....	" .....	Oct.	17, 1878	May	19, 1879
Langevin, C.B., K.C.M.G., Sir Hector L.....	" .....	May	20, 1879	Aug.	11, 1891
Smith, Hon. Frank. ....	Acting Minister .....	Aug.	14, 1891	Jan.	10, 1892
Ouimet, Hon. Joseph Aldric.....	Minister.. .....	Jan.	11, 1892	April	30, 1896
Desjardins, Hon. Alphonse.....	" .....	May	1, 1896	July	12, 1896
Tarte, Hon. J. Israël . . . . .	" .....	July	13, 1896	Oct.	21, 1902
Sutherland, Hon. James.....	" .....	Nov.	11, 1902		
Trudeau, Toussaint.....	Deputy Minister.....	May	29, 1868	Oct.	1, 1879
Baillairgé, G. F.....	" .....	Oct.	4, 1879	Dec.	31, 1890
Gobeil, A.....	" .....	Jan.	1, 1891		
Braun, Frederick.....	Secretary.....	July	1, 1867	Sept.	30, 1879
Chapleau, S.....	" .....	Oct.	1, 1879	Nov.	4, 1880
Ennis, F. H .....	" .....	Nov.	5, 1880	Jan.	13, 1885
Gobeil, A.....	" .....	Jan.	23, 1885	Dec.	31, 1890
Roy, E. F. E .....	" .....	"	1, 1891	"	31, 1900
Gelinas, Fred.....	" .....	June	8, 1901		
McPherson, D. A.....	Assistant Secretary.....	Jan.	18, 1891	April	11, 1893
Desrochers, Rodolphe Charles.....	" .....	"	8, 1896		
Page, John . . . . .	Chief Engineer.....	July	1, 1868	Oct.	1, 1879
Perley, H. F.....	" .....	Nov.	25, 1880	July	10, 1891
Coste, Louis.....	" .....	July	26, 1892	March	18, 1899
Lafleur, E. D .....	Acting Chief Engineer.....	March	18, 1899		
Scott, Thos. S.....	Chief Architect.....	May	26, 1871	Oct.	30, 1881
Fuller, Thomas .....	" .....	Oct.	31, 1881	June	30, 1897
Ewart, David, I.S.O.....	" .....	Nov.	2, 1897		



NAMES  
OF THE  
OFFICIALS EMPLOYED ON THE SLIDES AND BOOMS OF CANADA  
ON JUNE 30, 1903  
WITH  
DATES OF APPOINTMENT, SALARIES, ETC.



OFFICIALS EMPLOYED ON THE SLIDES AND BOOMS.

STATEMENT showing the Names, Dates of Appointment, Salaries, &c., of persons employed on the various Slides and Booms, on June 30, 1903.

Name.	Date of Birth.	Position.	Where employed.	Date of Appointment.	Salary.	Remarks.
<i>Collector of Slide and Boom Dues.</i>						
E. T. Smith	Nov. 26, 1846...	Collector	Ottawa...	July 1, 1889...	1,800 00 a year...	Date of first appointment to Crown timber office, Ottawa, June 23, 1864. Clerk in Dept. of Inland Rev., July 1, 1873, to June 30, 1889. Transferred to civil list with rank of first class clerk, January 5, 1892.
F. X. Gagné	Sept. 23, 1859...	Clerk	"	Dec. 16, 1897...	1,003 75	Entered the service Aug. 13, 1889.
James Steen	June 17, 1830...	Boatman	"	July 12, 1889...	60 00 a month...	Employed during the season of navigation, for 8 months each year. Date of first appointment, May 26, 1861. Timber counter, Ottawa, for Dept. of Inland Revenue, Jan. 7, 1834, to June 30, 1889
J. Brassard		"	"	March 1, 1901...	60 00	Employed during the season of navigation, for 8 months each year.
<i>Saguenay District.</i>						
<i>St. Maurice District</i>						
L. P. Dallaire		Paymaster	Three Rivers	May 1, 1898...	66 66 a month	Saguenay district slides abandoned by authority of O.C., dated Feb. 5, 1896 (No. 168,740).
P. Juneau		Boom master	Grand'Mère	May 1, 1902...	45 00	
Jos. Pagé	July 7, 1845...	"	M'th of St. Maurice.	Dec. 10, 1879...	75 00	
Jos. Dick		Asst. boom master	Three Rivers	May 19, 1898...	75 00	
Gédéon Rousseau		Boom master	Shawenigan Falls	April 7, 1896...	75 00	
Moïse Masson		"	Grandes Piles	May 19, 1898...	75 00	
N. Lynburner	July 22, 1855...	"	Shawenigan Falls	July 1, 1895...	75 00	
A. Paquin		"	Ste. Flore	Dec. 1, 1901...	75 00	
<i>Ottawa District.</i>						
G. P. Brophy	Feb. 24, 1846...	Superintendent	Ottawa	July 6, 1873...	2,500 00 a year.	<i>Ottawa River Works</i> —In addition to the above officers, &c., there are employed
D. Scott	" 15, 1830...	Accountant	"	Oct. 1, 1854...	1,500 00	



SESSIONAL PAPER No. 19

J. C. Scott.....	June 27, 1865 ..	Measurer ..	Ottawa.....	April 1, 1889...	3 50 a day.....	during the running season, one foreman on slide at \$1.50 and one assistant foreman at \$1.25 a day; also 25 to 30 labourers at \$1 to \$1.40 a working day.
J. Kent.....	Jan. 28, 1864....	Clerk .....	" .....	Aug. 1, 1886....	3 25 " .....	Actively employed about 7 months. Oversees repairs in winter.
Wm. Cain .....	April 22, 1860....	Messenger....	" .....	Jan. 1, 1892....	1 35 " .....	"
Pierre St. Pierre.....	.....	Deputy slide master.	Carillon .....	June 1, 1897....	1 40 " .....	"
D. Noonan.....	June 17, 1840....	Boom master..	Gatineau .....	Mar. 21, 1878....	500 00 a year.....	Employed about 6 months.
J. Soulière .....	Nov. 8, 1829....	Deputy slide master.	Chaudière .....	..... 1878....	2 50 a day.....	Oversees repairs in winter.
P. D. Chéné.....	.....	" .....	Hull.....	June 14, 1899..	1 50 " .....	Actively employed about 7 months.
W. A. Shireff.....	.....	" .....	Chats .....	April 26, 1898..	1 50 " .....	Employed about 3 months during season of navigation.
John Harvey .....	May 22, 1831....	Slide master .....	Arnprior .....	July 12, 1882....	2 50 " .....	Employed 5 months during season of navigation. Oversees repairs in winter.
Joseph McCrea..	Mar. 26, 1869....	Boom master.....	Springtown.....	May 15, 1880....	300 00 a year.....	"
Patrick Barry .....	" 27, 1858....	Slide master .....	High Falls.....	Mar. 10, 1888....	1 50 a day.....	"
Duncan McLaren....	Jan. 7, 1860....	Deputy slide master.	Portage du Fort .....	Sept. 7, 1881....	456 25 a year.....	"
D. Rochon .....	.....	" .....	Black River .....	.....	480 00 " .....	"
Wm Selkirk.....	.....	" .....	Lower Petewawa....	.....	2 00 a day.....	"
P. O'Connor .....	.....	" .....	Upper Petewawa....	Mar. 18, 1898....	2 00 " .....	"
Wm. Thompson....	May 3, 1843....	" .....	Mountain.....	Oct. 10, 1879....	1 25 " .....	6 mos,
S. Moorhead .....	.....	" .....	Calumet.....	Mar. 1, 1901....	1 25 " .....	" 6 to 7 mos. "
John Mullin.....	.....	" .....	Coulouge.....	April 10, 1890..	360 00 a year.....	" 4 mos. "
H. R. Downey....	May 16, 1846....	" .....	Des Joachims. ....	July 1, 1889....	360 00 " .....	" " "
J. F. McGuire.....	.....	" .....	Dumoine .....	May 1, 1897....	2 00 a day.....	Employed 3 months during season of navigation. Will inspect works when required.
J. J. French .....	.....	" .....	Crooked Chute.....	.....	2 00 " .....	" " "
A. H. Johnson.....	Nov. 28, 1839....	" .....	Chenaux.....	..... 1865....	2 50 " .....	Paid during season of navigation, 7 mos.
Newcastle District.						
S. Clegg.....	.....	Superintendent.....	Peterborough.....	Mar. 1, 1901....	1,600 00 a year.....	Receives \$500 a year from Department of Railways and Canals.
G. H. Giroux.....	.....	Clerk, Supt's office..	" .....	" 1, 1880....	400 00 " .....	\$250 a year as lock master, Dept. R. & C.
W. T. Junkin....	.....	Slide master.....	Fenelon Fall.....	Nov. 15, 1896....	100 00 " .....	Receives \$150 a year from Department of Railways and Canals.
R. T. Hill. ....	.....	" .....	Buckhorn.....	July 1, 1891....	100 00 " .....	"
Hamilton Johnston...	.....	" .....	Heeley's Falls .....	" 15, 1892....	200 00 " .....	Receives \$240 a year from Department of Railways and Canals.
John Dinwoodie .....	.....	" .....	Lakefield .....	June 20, 1893....	150 00 " .....	"
Richelieu District.						
C. Choquette.....	.....	Boom master.....	Belœil Station.....	July 26, 1897....	100 00 " .....	"



STATEMENT showing Names, &c., of persons employed on various works—*Concluded.*

Name.	Date of Birth.	Position.	Where employed.	Date of Appointment.	Salary.	Remarks.
<i>Burlington Channel Swing Bridge.</i>					\$ cts.	
Wm. Omand.....	.....	Bridge attendant....	Burlington.....	Sept. 19, 1896....	600 00 a year.....	
W. Hopkins .....	.....	" assistant. ....	" .....	July 1, 1902....	1 25 a day.....	
H. Lampman.....	.....	" .....	" .....	Sept. 8, 1902....	1 25 " .....	Employed 9 months.
Jas Eustice .....	.....	" .....	" .....	" 19, 1896 ..	1 25 " .....	"
<i>Yamaska Lock.</i>						
O. Mineau. ....	.....	Lock keeper.....	Yamaska .....	Sept. 1, 1885....	75 00 a month....	
H. Lambert.....	.....	" .....	" .....	July 1, 1897....	40 00 " .....	
<i>Rivière du Lièvre Lock.</i>						
Hugh R. Gorman.. ..	.....	Lock master.....	Rivière du Lièvre...	April 15, 1897....	40 00 " .....	
Charles Brazeau... .	.....	Labourer.....	" .....	Mar. 3, 1902....	35 00 " .....	
<i>Rivière St. Louis Feeder.</i>						
Julien Monpetit.....	.....	Gate keeper .....	Rivière St. Louis....	May, 11, 1903....	10 00 " .....	

JOS. VINCENT.



N A M E S

OF

PERSONS EMPLOYED ON THE VARIOUS GRAVING DOCKS

ON JUNE 30, 1903

WITH

DATES OF APPOINTMENT, SALARIES, ETC.



GRAVING DOCK EMPLOYEES.

STATEMENT showing the Names, Dates of Appointments, Salaries, &c., of Persons employed on the various Graving Docks, June 30, 1903.

Name.	Position.	Where Employed.	Date of Appointment.	Salary.	Remarks.
<i>Esquimalt Graving Dock, British Columbia.</i>					
John Devereux.....	Dockmaster.	Esquimalt.....	Sept. 17, 1887 ..	\$ 166 66 a month.....	
John Jeffcott.....	Engineer .....	" .....	Jan. 4, 1901 ..	100 00 ..	
F. N. Jones.....	Assistant engineer.....	" .....	" 8, 1901.....	80 00 ..	
A. D. Grieves .....	Carpenter .....	" .....	Dec. 1, 1887.....	80 00 ..	
W. Young.....	Labourer .....	" .....	" .....	50 00 ..	
J. Stock.....	" .....	" .....	July 1, 1894.....	50 00 ..	
Chas. Jordan. . . . .	Stoker.. ..	" .....	" .....	60 00 ..	
G. Springer .....	" ..	" .....	" .....	60 00 ..	
T. Young.....	Night watchman .....	" .....	" .....	50 00 ..	
<i>Lévis Graving Dock.</i>					
Alf. Samson .....	Dockmaster.....	Lévis .....	Feb. 15, 1900.....	1,000 00 a year.....	
Wm. Macdougall.....	Mechanical engineer .....	" .....	June 1, 1888 ..	75 00 a month.....	
T. Després.....	Asst. mechanical engineer...	" .....	July 21, 1901 ..	60 00 ..	
Narcisse Lemelin.....	Fireman .....	" .....	June 1, 1888.....	40 00 ..	
<i>Kingston Graving Dock.</i>					
F. S. Rees.....	Dockmaster.....	Kingston .....	April 1, 1897 ..	1,300 00 a year.....	
Robert McLeod.....	1st engineer.....	" .....	July 1, 1892.....	75 00 a month.....	
Wm. Geoghegan .....	Fireman ..	" .....	" 1, 1892.....	45 00 ..	
C. Staley .....	Watchman .....	" .....	" 1, 1892 ..	45 00 ..	

JOS. VINCENT.



LIST

OF

ENGINEERS, ENGINEMEN, FIREMEN AND CARETAKERS

EMPLOYED IN THE

PUBLIC BUILDINGS THROUGHOUT THE DOMINION ON JUNE 30, 1903

DATES OF APPOINTMENT, SALARIES, ETC.



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ENGINEERS AND CARETAKERS, PUBLIC BUILDINGS.

STATEMENT showing the Names, &c., of the Engineers, Firemen, Caretakers, Hoist Attendants and Watchmen employed at Dominion Public Buildings on June 30, 1903.

Place.	Building.	Name.	Date of Birth.	Position.	Date of Appointment.	Monthly Salary.	Time employed each Year.	Yearly Salary.
Amherst.	Post office	J. H. Chapman	Jan. 1, 1846	Caretaker.	Sept. 1, 1900	\$ 33 33	12 months.	\$ 400 00
Antigonish	Public building	Angus McDonald	Mar. —, 1820	"	Feb. 5, 1891	33 33	"	400 00
Annapolis	Post office and custom house	John McKay	Oct. 26, 1847	"	April 1, 1891	33 33	"	400 00
Baddeck	Public building	D. F. McKenzie	May 20, 1848	"	Jan. 21, 1899	20 83	"	250 00
Dartmouth	"	L. C. Henley	Dec. 11, 1846	"	May 22, 1894	20 83	"	250 00
Digby	"	F. Dennison	Nov. 8, 1841	"	Mar. 14, 1902	33 33	"	400 00
Halifax	Dominion building	Richard Power	Aug. 5, 1834	Engineer.	Oct. 1, 1871	62 50	"	750 00
"	"	John Powell	" 21, 1836	Fireman.	" 1, 1871	50 00	8	400 00
"	"	J. F. Sullivan	April 16, 1866	Caretaker.	July 1, 1892	33 33	"	400 00
"	"	W. H. Gray	Nov. 26, 1848	Watchman.	Sept. 10, 1891	39 00	"	468 00
"	Drill hall	John Crowell	Feb. 26, 1852	Fireman.	Dec. 13, 1901	50 00	8	400 00
"	"	R. Harmon	Dec. 23, 1868	Caretaker.	Dec. 3, 1898	50 00	"	600 00
"	Armouries	R. Morrison	Mar. 26, 1857	Fireman.	Mar. 4, 1903	50 00	8	400 00
"	Examining warehouse	M. O'Neil	Dec. 30, 1850	Caretaker.	Oct. 1, 1897	33 33	"	400 00
"	Immigrant building	John Oxley	April 17, 1856	Fireman.	Feb. 2, 1897	50 00	"	600 00
"	Public building	W. Hiltz	" 4, 1864	Caretaker.	Nov. 14, 1900	33 33	"	400 00
Kentville	"	James Clements	June 5, 1835	"	June 27, 1900	33 33	"	400 00
Liverpool	"	J. E. Hebb	Nov. 3, 1833	"	" 7, 1895	25 00	"	300 00
Lunenburg	"	J. A. Mutch	Dec. 13, 1840	"	Oct. 3, 1901	25 00	"	300 00
New Glasgow	Post office	Alex Green	July 16, 1825	"	" 1, 1897	33 33	"	400 00
North Sydney	Public building	Jas. Arbuckle	Feb. 18, 1836	"	Dec. 20, 1896	41 66	"	500 00
Pictou	Post office and custom house	S. McDowell	June 26, 1846	"	Feb. 11, 1902	33 33	"	400 00
Springhill	Post office	L. Keefe	May 1, 1883	"	Jan. 1, 1903	33 33	"	400 00
Sydney South	Post office and custom house	Alex. P. Smith	" 17, 1837	"	April 1, 1897	29 16	"	350 00
Truro	"	J. A. Mosher	Nov. 16, 1841	"	Feb. 13, 1899	33 33	"	400 00
Windsor	Public building	W. H. Whallen	Dec. 23, 1841	"	Mar. 1, 1900	33 33	"	400 00
Yarmouth	Dominion building	Wm. J. Fraser	Jan. 1, 1836	" & fireman	April 3, 1894	33 33	"	400 00
Charlottetown	"	Geo. Walker	Aug. 28, 1826	Messenger.	Jan. 19, 1875	41 67	"	500 00
"	"	M. A. Allan	Aug. 1, 1855	"	" 24, 1898	41 67	"	500 00
"	"	Angus McKenzie	Mar. 12, 1856	Watchman.	Nov. 1, 1896	45 00	"	540 00
Montague	Public building	W. Gillis	Oct. —, 1831	Caretaker.	May 9, 1898	13 33	"	160 00
Summerside	Dominion building	A. MacSween	Sept. 25, 1835	"	Sept. 1, 1897	33 33	"	400 00
Bathurst	Post office	S. P. Achey	Aug. 18, 1873	"	Jan. 1, 1903	33 33	"	400 00
—atham	"	C. Johnston	May 18, 1856	"	Mar. 27, 1895	25 00	"	300 00



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Carleton, St. John.. N.B.	Post office.....	James R. Reid.....	Aug.	15,	1823	Caretaker.....	Oct.	1,	1889	8	33	12	months...	100 00
Dalhousie.....	".....	Wm. Gould.....	Jan.	1,	1853	".....	Nov.	26,	1890	33	33	12	"	400 00
Fredericton.....	".....	L. Yerza.....	Dec.	18,	1843	".....	July	1,	1900	33	33	12	"	400 00
Moncton.....	".....	E. B. Hicks.....	Jan.	11,	1832	".....	Jan.	11,	1886	33	33	12	"	400 00
Newcastle.....	".....	Patrick Keating.....	Mar.	13,	1840	".....	Oct.	23,	1886	33	33	12	"	400 00
St. John.....	Custom house.....	Neil J. Morrison.....	July	25,	1858	Eng. & caretaker	April	27,	1894	60	00	12	"	720 00
".....	".....	Christopher White.....	Nov.	20,	1844	Fireman.....	Nov.	9,	1885	50	00	12	"	600 00
".....	".....	James A. Paul.....	Aug.	1,	1837	Caretaker.....	Oct.	13,	1891	41	67	12	"	500 00
".....	Post office.....	James Wolfe.....	Mar.	10,	1850	Engineer.....	Dec.	1,	1893	55	00	12	"	660 00
".....	".....	Edward Haney.....	Feb.	22,	1849	Hoist attendant.	Nov.	27,	1882	50	00	12	"	600 00
St. Stephen.....	".....	Samuel Topping.....	April	2,	1839	Caretaker.	May	25,	1887	33	33	12	"	400 00
Sussex.....	".....	Mrs. N. Dryden.....	June	21,	1840	".....	Mar.	26,	1901	16	66	12	"	200 00
Woodstock.....	".....	Charles Trafton.....	Jan.	20,	1839	".....	May	1,	1897	33	33	12	"	400 00
Aylmer..... P.Q.	".....	Miss M. G. Woods.....	May	16,	1860	".....	April	29,	1895	5	00	12	"	60 00
Coaticook.....	Public building.....	Israel Baldwin.....	Nov.	16,	1839	".....	June	27,	1889	33	33	12	"	400 00
Drummondville...	".....	A Paré.....	April	27,	1842	".....	"	5,	1902	25	00	12	"	300 00
Granby.....	".....	J. A. Beauchemin.....	May	1,	1862	".....	May	12,	1903	25	00	12	"	300 00
Fraserville.....	Post office.....	Z. Raymond.....	Nov.	—,	1831	".....	Nov.	2,	1897	25	00	12	"	300 00
Hochelaga.....	".....	J. H. Brown.....	Oct.	7,	1851	".....	Mar.	27,	1902	15	66	12	"	200 00
Hull.....	"..... &c.....	J. I. Madore.....	Dec.	1,	1843	".....	"	8,	1900	12	50	12	"	150 00
Joliette.....	".....	A. Ratel.....	"	29,	1845	".....	Sept.	1,	1897	33	33	12	"	400 00
Lachine.....	".....	P. O. Robert.....	Sept.	7,	1846	".....	Jan.	26,	1899	8	33	12	"	100 00
Laprairie.....	".....	Jos. Brisson.....	Nov.	11,	1869	".....	Nov.	22,	1901	4	16	12	"	50 00
Montreal.....	Dominion building.....	S. T. Murphy.....	May	6,	1865	Foreman engin'r	Mar.	2,	1903	100	00	12	"	1,200 00
".....	".....	Ed. Lanctot.....	April	14,	1837	Caretaker.....	Dec.	3,	1898	41	67	12	"	500 00
".....	Examining warehouse.....	M. Boyer.....	Feb.	18,	1848	Fireman.....	Mar.	4,	1882	50	00	12	"	600 00
".....	".....	Nap. Loiseau.....	Dec.	12,	1866	".....	Dec.	4,	1894	45	00	12	"	540 00
".....	".....	Jos. Loiseau.....	Jan.	4,	1869	Caretaker.....	Nov.	15,	1901	45	00	8	"	360 00
".....	Post office.....	F. Green.....	Oct.	4,	1837	Engineer.....	Jan.	1,	1885	60	00	12	"	720 00
".....	".....	L. D. Thibault.....	Jan.	28,	1861	Electrician.....	June	1,	1885	75	00	12	"	900 00
".....	".....	G. S. Gingras.....	Dec.	13,	1867	" &c.....	Jan.	7,	1895	60	00	12	"	720 00
".....	".....	I. Trudeau.....	Jan.	22,	1863	Caretaker.....	Oct.	1,	1902	50	00	12	"	600 00
".....	".....	Oscar Renaud.....	Feb.	19,	1862	Elevator man...	Sept.	10,	1898	50	00	12	"	600 00
".....	".....	Art. Forget.....	July	25,	1867	".....	Dec.	15,	1893	50	00	12	"	600 00
".....	".....	S. N. Nickle.....	Dec.	25,	1871	".....	Mar.	1,	1894	55	00	12	"	660 00
".....	".....	L. Brault.....	"	29,	1854	".....	Sept.	1,	1901	50	00	12	"	600 00
".....	".....	C. Vadeboncoeur.....	May	17,	1842	Caretaker w. c..	Feb.	6,	1864	1.50 p. d.	50	12	"	547 50
".....	".....	J. Dulrisac.....	Feb.	2,	1863	Messenger.....	Dec.	15,	1893	2.00 p. d.	730	00	"	730 00
".....	Inland revenue.....	Louis St. Jean.....	Sept.	17,	1840	Fireman.....	"	1,	1892	50	00	12	"	600 00
".....	Examining warehouse.....	H. Marchand.....	"	6,	1849	".....	"	2,	1882	45	00	12	"	540 00
".....	Custom house.....	C. Daudelin.....	June	19,	1843	".....	July	16,	1892	29	16	12	"	350 00
".....	Custom house and ex. wareh.	B. Lajeunesse.....	Nov.	20,	1861	".....	Nov.	23,	1896	50	00	12	"	600 00
".....	Drill hall and armoury.....	J. Gagnier.....	April	4,	1867	Engineman.....	Feb.	14,	1899	45	00	12	"	540 00
".....	".....	A. James.....	Nov.	29,	1872	Fireman.....	Jan.	1,	1900	45	00	8	"	360 00
Quebec.....	Examining warehouse".....	D. P. Kennedy.....	Feb.	9,	1865	Engineer.....	April	1,	1897	75	00	12	"	900 00
".....	".....	T. P. McLaughlin.....	Aug.	25,	1871	Fireman.....	Aug.	26,	1892	53	33	12	"	640 00
".....	Cullers office.....	James O'Neil.....	"	15,	1861	".....	"	1,	1894	45	00	12	"	540 00
".....	Custom office.....	John R. Mountain.....	Nov.	1,	1848	".....	Nov.	10,	1888	45	00	12	"	540 00
".....	Govr. gen'l's quarters.....	P. Parent.....	May	29,	1852	".....	Jan.	1,	1902	33	33	12	"	400 00
".....	Post office.....	J. Roy.....	Feb.	25,	1836	Caretaker.....	Sept.	1,	1897	58	33	12	"	700 00



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STATEMENT showing the Names, &c., of the Engineers, Firemen, Caretakers, Hoist Attendants and Watchmen employed at the Dominion Public Buildings, &c.--Continued.

Place.	Building.	Name.	Date of Birth.	Position.	Date of Appointment.	Monthly Salary.	Time employed each Year.	Yearly Salary.
						\$ c.		\$ c.
Quebec.	P. Q.	F. J. Cooper.	July 8, 1858	Fireman.	June 25, 1895	55 00	12 months.	660 00
Peribonca.		E. Roy.	Dec. 14, 1877	Caretaker.	Oct. 1, 1902	25 00	12 "	300 00
Roberval.		J. B. Carboneau.	Aug. 12, 1864	"	Nov. 20, 1901	25 00	12 "	300 00
Rimouski.		A. Lepage.	Feb. 7, 1866	"	Jan. 1, 1901	12 50	12 "	150 00
Richmond.		H. Desmarais.	July 14, 1869	"	May 7, 1898	20 83	12 "	250 00
Sherbrooke.		O. Desève.	Aug. 6, 1848	"	April 2, 1898	33 33	12 "	400 00
Sorel.		C. Robitaille.	Jan. 22, 1848	"	Sept. 1, 1897	33 33	12 "	400 00
Saint-Henri.		A. C. A. Bissonnette.	May 25, 1858	"	Mar. 4, 1895	.....	.....	.....
Saint-Hyacinthe.		F. X. Tétrault.	Nov. 8, 1846	Fireman.	Aug. 5, 1893	33 33	12 months.	400 00
Saint-Jean.		L. Forrant.	Jan. 21, 1849	Caretaker.	April 14, 1897	29 16	12 "	350 00
Saint-Jérôme.		J. Savard.	Oct. 24, 1859	"	Sept. 1, 1900	33 33	12 "	400 00
Trois-Rivières.		Ph. Gravelle.	June 3, 1828	"	Feb. 1, 1891	25 00	12 "	300 00
"		A. Gauthier.	Feb. 4, 1850	"	" 1, 1898	33 33	12 "	400 00
Victoriaville.		H. H. Dunn	May 9, 1874	"	Oct. 4, 1902	6 25	12 "	75 00
Ambertsburg.	Ont.	R. Elliott.	Aug. 22, 1835	"	May 7, 1897	33 33	12 "	400 00
Almonte.		Wm Moulton.	Mar. 23, 1839	"	Jan. 29, 1891	33 33	12 "	400 00
Arnprior.		R. B. McCrery.	Jan. 11, 1862	"	Mar. 15, 1899	33 33	12 "	400 00
Brockville.		H. Purvis.	Sept. 12, 1826	"	Dec. 15, 1900	33 33	12 "	400 00
Brantford.		John Squire	April 24, 1842	"	Oct. 27, 1889	50 00	12 "	600 00
Barrie.		E. Seigny.	Mar. 19, 1847	"	May 1, 1903	41 66	12 "	500 00
Belleville.		S. Haight.	Aug. 26, 1857	"	Jan. 24, 1901	50 00	12 "	600 00
Berlin.		J. Clemen.	June 21, 1840	"	May 15, 1900	33 33	12 "	400 00
Brampton.		James McBride.	Oct. 5, 1840	"	Jan. 29, 1891	33 33	12 "	400 00
Carleton Place.		Jas. F. Halfpenny	April 17, 1858	"	May 13, 1892	25 00	12 "	300 00
Chatham.		W. W. Mitchell.	May 25, 1848	"	Jan. 7, 1885	41 66	12 "	500 00
Cornwall.		R. Conroy.	Nov. 6, 1848	"	Jan. 1, 1897	33 33	12 "	400 00
Cayuga.		G. A. Gibson.	May 29, 1861	"	Sept. 3, 1891	4 16	12 "	50 00
Cobourg.		John Boyd.	Dec. 9, 1836	"	Aug. 1, 1901	33 33	12 "	400 00
Dundas.		Wm Graham.	" 5, 1853	"	July 1, 1898	4 16	12 "	50 00
Galt.		T. Barrett.	June 17, 1861	"	Aug. 1, 1902	33 33	12 "	400 00
Guelph.		R. McLeod.	July 30, 1865	"	May 25, 1901	33 33	12 "	400 00
Goderich.		G. Bissett.	April 14, 1851	"	Sept. 1, 1897	33 33	12 "	400 00
Hamilton.		Alfred Barnard.	Dec. 27, 1847	"	Dec. 10, 1894	50 00	12 "	600 00
"		J. Wigglesworth	Aug. 7, 1863	Fireman.	Oct. 1, 1896	50 00	8 "	400 00
"		Thomas Nicholson.	Dec. 17, 1857	Engineer.	Mar. 2, 1887	50 00	12 "	600 00
Ingersoll.		John McDonald.	June 30, 1841	Caretaker.	Nov. 20, 1900	33 33	12 "	400 00



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Kingston.....	Ont.	R. Military College.....	Wm F. Hazlett.....	May	27,	1854	Engineer..	Nov.	20,	1900	75 00	12 months ..	900 00
" .....	"	" .....	J. Quigley .....	Oct.	30,	1857	Fireman .....	June	1,	1903	55 00	12 "	660 00
" .....	"	" .....	M. Redmond.....	"	2,	1867	" .....	Jan.	29,	1902	45 00	12 "	540 00
" .....	"	" .....	L. Cochrane .....	Mar.	1,	1879	Electrician.....	July	29,	1902	55 00	12 "	660 00
London.....	"	Custom house.....	M. Mulkern.....	Sept.	4,	1837	Engineman.....	Sept.	18,	1888	50 00	12 "	600 00
" .....	"	Post office .....	Wm Greer .....	Oct.	12,	1839	Caretaker.....	Mar.	16,	1884	33 33	12 "	400 00
London.....	"	" .....	John Price.....	Oct.	6,	1836	Engineer.....	Jan.	14,	1884	50 00	12 "	600 00
Lindsay.....	"	" and C. house.....	Wm. Galbraith .....	Jan.	8,	1844	Caretaker.	Nov.	17,	1893	33 33	12 "	400 00
Napanee.....	"	" .....	Mrs. C. E. Webster.	July	12,	1846	" .....	Oct.	4,	1901	33 33	12 "	400 00
Niagara Falls.....	"	" .....	Wm. J. Sheppard.....	Jan.	4,	1854	" .....	Jan.	15,	1897	33 33	12 "	400 00
Orangeville.....	"	" .....	D. McPherson.....	April	30,	1851	" .....	July	15,	1900	33 33	12 "	400 00
Orillia .....	"	" .....	John Frawley.....	Mar.	14,	1841	" .....	Nov.	1,	1898	25 00	12 "	300 00
Paris.....	"	" .....	Sam Lee.....	1842			" .....	July	7,	1902	33 33	12 "	400 00
Peterborough ..	"	Public building.....	John Irwin .....	May	17,	1842	" .....	Sept.	8,	1887	25 00	12 "	300 00
" .....	"	Post office.....	Wm. Taylor.....	Nov.	25,	1839	" .....	Jan.	26,	1889	25 00	12 "	300 00
Petrollea.....	"	Custom house.....	H. McNaughton.....	Sept.	14,	1862	" .....	May	1,	1903	33 33	12 "	400 00
Pictou.....	"	Post office.....	D. Webarks .....	Feb.	8,	1850	" .....	April	11,	1902	33 33	12 "	400 00
Port Colborne. ....	"	Public building.....	Wm. Armstrong.....	Sept.	9,	1846	" .....	June	11,	1888	20 00	12 "	240 00
Port Hope.....	"	Post office.....	Levi Reynolds.....	Feb.	15,	1839	" .....	Nov.	17,	1885	33 33	12 "	400 00
Port Arthur.....	"	" .....	John Whitehead .....	April	15,	1839	" .....	Sept.	11,	1893	25 00	12 "	300 00
Pembroke.....	"	Public building .....	Samuel Hamilton.....	June	4,	1834	" .....	Oct.	29,	1890	33 33	12 "	400 00
Prescott.....	"	" .....	R. Birks.....	April	6,	1822	" .....	May	1,	1899	33 33	12 "	400 00
Rat Portage.. ....	"	Post office.....	Mrs. J. Link .....	May	10,	1850	" .....	Dec.	7,	1901	33 33	12 "	400 00
Smith's Falls .....	"	Public building.....	R. W. Lewis .....	Aug.	19,	1863	" .....	Jan.	8,	1896	25 00	12 "	300 00
Stratford .....	"	" .....	J. P. Murray .....	July	29,	1855	Engineer.....	Jan.	26,	1900	50 00	12 "	600 00
St. Catharines.....	"	Post office, &c.....	Louis Reno .....	Oct.	24,	1842	Caretaker.....	Feb.	27,	1897	33 33	12 "	400 00
St. Thomas.....	"	" .....	G. Luton.....	May	25,	1857	" .....	April	14,	1903	33 33	12 "	400 00
Strathroy.....	"	" .....	Wm. J. Johnston.....	"	12,	1840	" .....	Oct.	25,	1890	33 33	12 "	400 00
Toronto.....	"	Public building .....	H. E. Hamilton .....	April	14,	1838	Forem., engineer	April	10,	1902	100 00	12 "	1,200 00
" .....	"	Dominion buildings.....	C. H. Bailie .....	Sept.	22,	1852	Fireman .....	Jan.	13,	1891	55 00	12 "	650 00
" .....	"	Inland revenue building.....	Fred. Faragher.....	Oct.	16,	1865	" .....	Nov.	1,	1889	55 00	12 "	660 00
" .....	"	Custom-house.....	Ed. Switzer .....	"	10,	1856	Hoist attendant.	Aug.	18,	1901	55 00	12 "	660 00
" .....	"	" .....	James Cosgrove .....	Feb.	10,	1844	Engineer.....	Dec.	28,	1874	70 00	12 "	840 00
" .....	"	Examining warehouse.....	Ed. Appleton.....	Sept.	26,	1864	Fireman .....	Sept.	23,	1886	55 00	12 "	660 00
" .....	"	" .....	Alexander Dey .....	"	27,	1863	Hoist attendant.	Dec.	1,	1887	50 00	12 "	600 00
" .....	"	" .....	Wm. Chenery.....	Dec.	19,	1851	" .....	"	1,	1887	50 00	12 "	600 00
" .....	"	" .....	M. Boland.....	Sept.	29,	1847	" .....	Oct.	24,	1902	50 00	12 "	600 00
" .....	"	" .....	Thos. Jones .....	Nov.	10,	1853	Watchman.....	April	4,	1902	50 00	12 "	600 00
" .....	"	Union station.....	J. Gornaly.....	"	26,	1872	Hoist attendant.	Oct.	17,	1901	50 00	12 "	600 00
" .....	"	P. O. Station "C" .....	J. C. Davidson .....	May	21,	1876	Caretaker.....	April	1,	1902	41 66	12 "	500 00
" .....	"	" Union station "A" ..	D. Gionna.....	Aug.	8,	1867	Elevatorman.....	Oct.	1,	1898	50 00	12 "	600 00
" .....	"	Post office.....	J. Somers .....	April	8,	1835	Engineer.....	"	9,	1897	45 00	8 "	360 00
" .....	"	" .....	George Letray.....	May	20,	1858	Fireman .....	Nov.	1,	1896	50 00	8 "	400 00
" .....	"	" .....	G. Phillips.....	Oct.	11,	1856	" .....	Oct.	1,	1898	45 00	8 "	360 00
" .....	"	" .....	Richard Eyre.....	"	11,	1849	" .....	Mar.	25,	1895	50 00	12 "	600 00
" .....	"	Drill hall. ....	M. W. Devane .....	Aug.	28,	1867	Watchman.....	June	1,	1900	50 00	12 "	600 00
" .....	"	Examining warehouse.....	David Allen .....	May	13,	1844	Caretaker.....	Aug.	31,	1889	33 33	12 "	400 00
Trenton.....	"	Public building.....	I. Belleperche.....	Oct.	26,	1848	Engineman.....	Dec.	24,	1897	50 00	8 "	400 00
Windsor .....	"	Post office.....	W. Curtis.....	March	6,	1844	Caretaker.....	Nov.	9,	1880	33 33	12 "	400 00



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STATEMENT showing the Names, &c., of the Engineers, Enginemen, Fire men, Caretakers, Hoist Attendants and Watchmen employed at the Dominion Public Buildings, &c.—*Concluded.*

Place.	Building.	Name.	Date of Birth.	Position.	Date of Appointment.	Monthly Salary	Time employed each year.	Yearly Salary.
						\$ c.		\$ c.
Walkerton..... Ont.	Public building.....	T. Gibson .....	Aug. 14, 1838	Caretaker. ....	Nov. 1, 1897	33 33	12 months..	400 00
Woodstock..... "	" .....	Robert Kerr .....	June 6, 1864	" .....	Dec. 11, 1901	33 33	12 " .....	400 00
Brandon .....	" .....	T. Giles .....	Mar. 30, 1843	" .....	Aug. 1, 1897	50 00	12 " .....	600 00
Portage la Prairie.. "	" .....	R. Watson .....	Jan. 10, 1826	" .....	Oct. 1, 1902	33 33	12 " .....	400 00
Winnipeg..... "	Post office .....	J. D. McDougall.....	May 1, 1843	Engineman .....	Jan. 21, 1899	75 00	12 " .....	900 00
" .....	" .....	John Mikulezky .....	" 6, 1879	Fireman . ....	Nov. 13, 1900	45 00	12 " .....	540 00
" .....	" .....	Joseph Coutu .....	" 10, 1843	Hoist attendant.	Mar. 16, 1887	45 00	12 " .....	540 00
" .....	" .....	Joseph Gagnier .....	April 11, 1853	Watchman. ....	June 7, 1892	45 00	12 " .....	540 00
" .....	Custom-house.....	J. G. Russell.....	Oct. 15, 1857	Fireman . ....	Dec. 12, 1900	45 00	12 " .....	540 00
Calgary..... N.W.T.	Public building.....	E. N. Brown.....	Mar. 8, 1845	Caretaker.....	Jan. 24, 1891	45 00	12 " .....	540 00
" .....	Court-house.....	J. B. Mitchell.....	May 21, 1841	" .....	Dec. 1, 1902	45 00	12 " .....	540 00
Edmonton. .... "	Land and registry office.	R. Wylie.....	July 7, 1859	" .....	June 21, 1894	33 33	12 " .....	400 00
Lethbridge. .... "	Court-house & C.-house.....	E. J. Hodder .....	Aug. 4, 1854	" .....	Mar. 1, 1901	35 00	12 " .....	420 00
Moosomin..... "	" .....	J. C. Jopp.....	Jan. 6, 1848	" .....	April 29, 1897	50 00	12 " .....	600 00
Moose-Jaw..... "	" .....	R. Smale.....	July 21, 1865	" .....	Nov. 21, 1898	33 33	12 " .....	400 00
Macleod .....	" .....	John Ryan.....	June 24, 1827	" .....	" 1, 1893	14 58	12 " .....	175 00
Medicine Hat..... "	" .....	J. H. G. Bray .....	Jan. 24, 1841	" .....	June 7, 1900	45 00	12 " .....	540 00
Prince Albert..... "	Land and registry office.	George Cassie .....	" 13, 1833	" .....	Aug. 25, 1893	33 33	12 " .....	400 00
Regina..... "	Court-house & C.-house.....	P. McAr. ....	Mar. 24, 1840	" .....	" 1, 1889	45 00	12 " .....	540 00
" .....	" .....	Jas. McLachlan. ....	Dec. 9, 1840	Fireman . ....	Oct. 3, 1898	40 00	8 " .....	320 00
" .....	Land office.....	W. J. Gore.....	July 22, 1863	Caretaker.....	May 6, 1901	45 00	12 " .....	540 00
Wolseley..... "	Court House .....	W. Hare.....	Dec. 2, 1857	" .....	Mar. 1, 1901	45 00	12 " .....	540 00
Atlin .....	Public building .....	J. A. Fraser .....	Jan. 1, 1851	" .....	June 26, 1901	12 50	12 " .....	150 00
Kamloops..... "	Post office .....	W. Saul.....	Dec. 15, 1837	" .....	April 1, 1902	50 00	12 " .....	600 00
Nanaimo..... "	" .....	J. Thompson.....	Sept. 2, 1836	" .....	May 1, 1897	50 00	12 " .....	600 00
Nelson..... "	Public building.....	B. B. Smith.....	" 12, 1845	" .....	Mar. 7, 1903	50 00	12 " .....	600 00
New Westminster.. "	Post office.....	G. D. McMurphy.....	Dec. 21, 1870	" .....	Jan. 18, 1901	50 00	12 " .....	600 00
Rosland..... "	Public building.....	D. Mackenzie. ....	Oct. 14, 1848	" .....	April 1, 1903	50 00	12 " .....	600 00
Vancouver .....	" .....	Atwell King.....	April 6, 1843	" .....	Aug. 25, 1893	50 00	12 " .....	600 00
" .....	" .....	P. Powers .....	Mar. 21, 1836	Watchman .....	Feb. 10, 1901	50 00	12 " .....	600 00
Victoria .....	New Dominion building	Wm. McKay .....	Dec. 31, 1857	Caretaker.....	" 4, 1898	50 00	12 " .....	600 00
" .....	Dominion building.....	A. Johnson.....	May 12, 1858	Asst. caretaker .	April 1, 1899	45 00	12 " .....	540 00
" .....	" .....	J. D. Milne.....	Oct. 12, 1840	Fireman . ....	Oct. 4, 1898	45 00	8 " .....	360 00
" .....	" .....	J. McMillan .....	July 8, 1876	Elevatorman....	Nov. 27, 1898	60 00	12 " .....	720 00
" .....	Dominion building .....	Geo. Noot .....	Aug. 9, 1845	" .....	Oct. 13, 1900	45 00	12 " .....	540 00
" .....	Old Custom-House .....	Geo Lyoll.....	Feb. 12, 1843	Caretaker.....	May 8, 1900	50 00	12 " .....	600 00



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Dawson.....	Y.T.	Post office	J. W. Wilson.	.....	Caretaker	.....	Jan.	1, 1902	160 00	12 months..	1,920 00
" .....	"	"	W. Bishop.....	.....	Watchman.	.....	May	1, 1901	160 00	" .....	1,920 00
" .....	"	"	Mrs. R. Palardis..	.....	Charwoman.....	.....	"	1, 1902	150 00	" .....	1,800 00
" .....	"	Government House	S. Waldron.....	.....	Caretaker.	.....	Oct.	15, 1901	125 00	" .....	1,500 00
White Horse.....	"	Public building..	C. J. McLennan.....	.....	"	.....	"	30, 1902	100 00	" .....	1,200 00

JOS. VINCENT.







# OFFICIAL CORRESPONDENCE

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DEPARTMENT OF PUBLIC WORKS

FROM

JULY 1, 1867, TO JUNE 30, 1903.



OFFICIAL CORRESPONDENCE.

LETTERS Received and Sent from July 1, 1867, to June 30, 1903.

Year.				Received.	Sent.
1867	From July 1 to December 31.			2,075	1,511
1868	" January 1 to December 31.			3,498	2,317
1869	" " "			3,448	2,171
1870	" " "			4,961	3,185
1871	" " "			6,268	3,983
1872	" " "			8,333	4,428
1873	" " "			10,072	5,707
1874	" " "			9,800	5,043
1875	" " "			9,006	5,006
1876	" " "			7,971	4,773
1877	" " "			7,517	4,425
1878	" " "			6,886	4,021
1879	" " to October 6.			7,186	4,547
1879	" October 7 to December 31.			2,033	810
1880	" January 1 "			8,451	4,410
1881	" " "			9,599	5,529
1882	" " "			10,505	5,699
1883	" " "			11,637	6,227
1884	" " "			13,114	6,903
1885	" " "			8,977	5,321
1886	" " "			9,644	5,352
1887	" " to June 30.			4,866	2,735
1887	" July 1 "	1888		10,493	6,343
1888	" " "	1889		10,522	7,042
1889	" " "	1890		10,098	7,448
1890	" " "	1891		10,576	7,286
1891	" " "	1892		11,637	6,700
1892	" " "	1893		11,720	6,220
1893	" " "	1894		9,517	6,028
1894	" " "	1895		10,190	5,148
1895	" " "	1896		10,223	5,573
1896	" " "	1897		11,404	5,033
1897	" " "	1898		9,640	5,250
1898	" " "	1899		9,639	4,784
1899	" " "	1900		12,139	5,938
1900	" " "	1901		13,179	6,255
1901	" " "	1902		15,880	5,067
1902	" " "	1903		13,140	6,373



## SESSIONAL PAPER No. 19

LETTERS Sent from Chief Engineer's Office, from January, 1880, to June 30, 1903.

Year.		No.
1880.....	From January 10 to June 30.....	418
1880.....	" July 1 " 1881.....	1,795
1881.....	" " " 1882.....	2,352
1882.....	" " " 1883.....	2,651
1883.....	" " " 1884.....	3,611
1884.....	" " " 1885.....	3,119
1885.....	" " " 1886.....	2,867
1886.....	" " " 1887.....	3,281
1887.....	" " " 1888.....	3,552
1888.....	" " " 1889.....	4,229
1889.....	" " " 1890.....	3,374
1890.....	" " " 1891.....	3,948
1891.....	" " " 1892.....	4,009
1892.....	" " " 1893.....	4,232
1893.....	" " " 1894.....	3,966
1894.....	" " " 1895.....	4,603
1895.....	" " " 1896.....	4,239
1896.....	" " " 1897.....	4,994
1897.....	" " " 1898.....	4,696
1898.....	" " " 1899.....	5,277
1899.....	" " " 1900.....	7,366
1900.....	" " " 1901.....	4,341
1901.....	" " " 1902.....	6,759
1902.....	" " " 1903.....	4,327

NOTE.—The letters, including returns, received in the Chief Engineer's Office may be estimated at the rate of two received to one sent.

LETTERS Received and Sent, Chief Architect's Office, from January 1, 1880, to June 30, 1903.

Year.	Received.	Sent.
1880—From January 1 to June 30.....		1,273
1880 " July 1 " 1881.....		2,943
1881 " " " 1882.....		2,859
1882 " " " 1883.....	3,538	4,600
1883 " " " 1884.....	3,860	6,004
1884 " " " 1885.....	4,500	6,718
1885 " " " 1886.....	6,075	6,450
1886 " " " 1887.....	6,816	6,380
1887 " " " 1888.....	6,947	6,870
1888 " " " 1889.....	6,484	7,667
1889 " " " 1890.....	7,448	6,578
1890 " " " 1891.....		7,751
1891 " " " 1892.....	6,113	4,260
1892 " " " 1893.....	7,428	6,453
1893 " " " 1894.....	6,900	4,517
1894 " " " 1895.....	7,538	5,327
1895 " " " 1896.....	7,843	5,783
1896 " " " 1897.....	10,700	8,200
1897 " " " 1898.....	10,867	8,547
1898 " " " 1899.....	10,913	8,762
1899 " " " 1900.....	12,386	9,878
1900 " " " 1901.....	12,287	9,860
1901 " " " 1902.....	12,560	10,330
1902 " " " 1903.....	13,430	11,106



